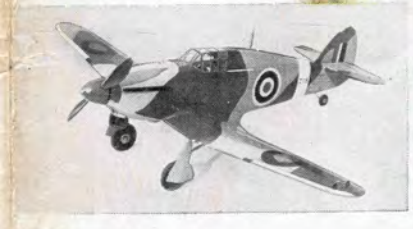
SEPTEMBER 1953/35 CENTS

Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

FW-190 Model

Plus: Radio Control Bipe



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LABORATORY REPORT

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Nitrogen	6.9 lb.	11.7	10.2	9.4
Water Condensed . .	1.21	1.5	1.75	2.15
Residue at 210° F Grams/100 ml: . . .	21.63	24.99	23.68	26.58
Sediment Centrifuge %:	trace	.3	.5	8.0

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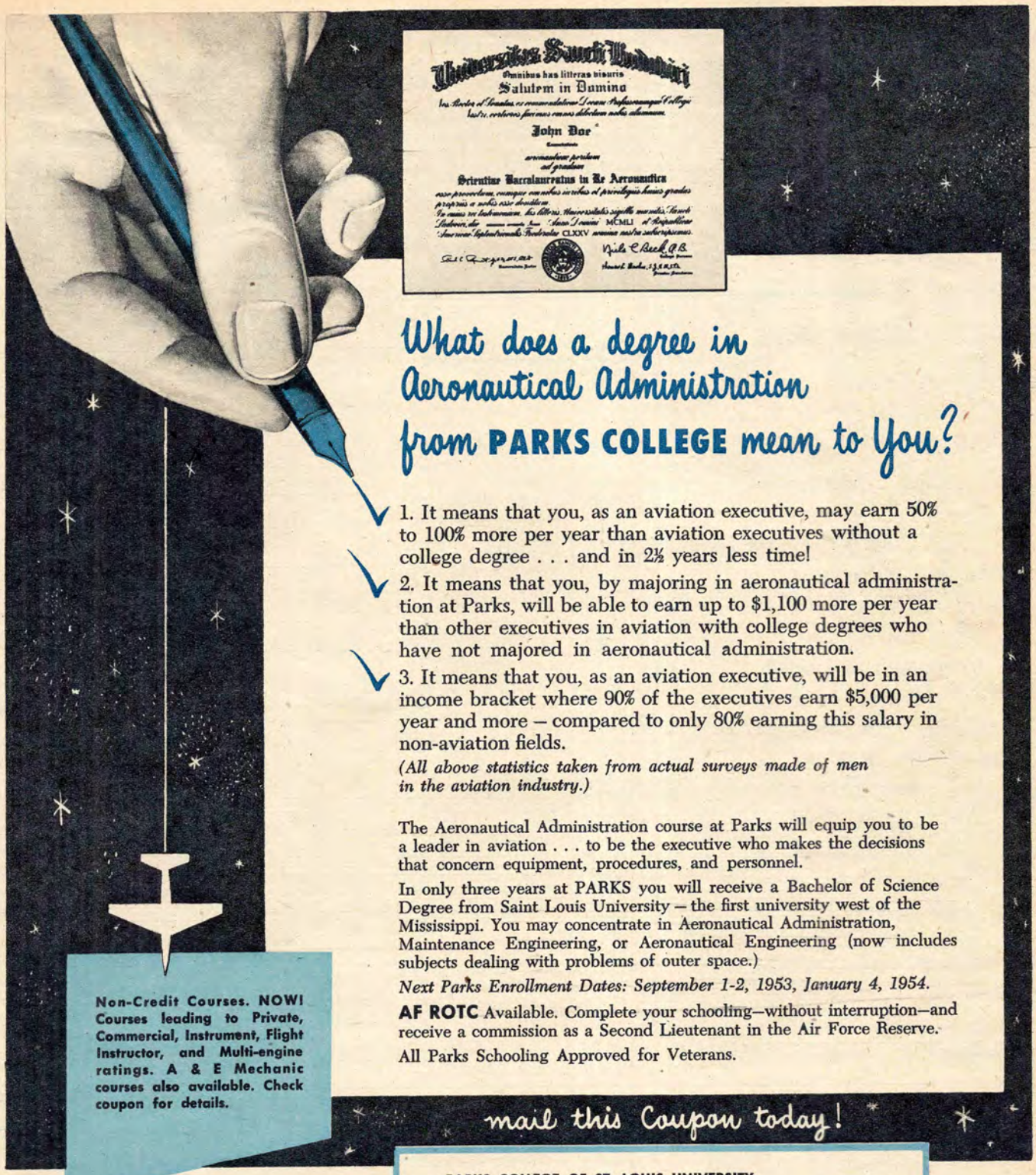

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Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Cover: A trio of famous World War II fighters—the German Fw-190 which in many of its variations was the backbone of Luftwaffe; the British Hurricane, RAF's mainstay during Battle of Britain, and U.S. Navy's Grumman Wildcat with which Lt. Cmdr. "Butch" O'Hare shot down 5 Japs in one fight.

Sept. 1953 • Vol. 40, No. 6

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FROM THE READER

USAFers Like C/S Scale . . . As a member of the U. S. Air Force my hobby is, of course, model aircraft and flying in general. I want you to know just how popular your magazine is with the boys here on the base. I get a copy every month, and by the end of the month, it is thumbed through till it is dog-eared. They are always asking me if I have gotten a new issue yet. The thing that interests them most seems to be control line scale models. There are some very fine ships here, and you can always, weather permitting, hear the buzz of a glow plug engine running somewhere on the base. The boys find some wonderful articles and a whale of a lot of shop talk goes on in my room practically all the time about models, engines and the like. Keep up the wonderful work in putting out such a fine model fans' magazine.

A/3c W. W. Nicholas, Amarillo AFB, Tex.

P.S.: Just this minute, somebody came in to borrow my copy.

Midget Aircraft Address . . . Would you please send me the address of Midget Aircraft Sales & Service? This is the company that builds the Long Midget raceplane.

Ray Rockstead, Seattle, Wash.

• The address is 8 E. Main St., Plano, Ill.

Stix, Baer & Fuller Alumnus . . . I would like to compliment you on the presentation of Air Trails magazine and the material used, both of which have been excellent throughout the years. I base my opinion on my experience with your magazine as a constant reader and model builder since the early days of Air Trails Pictorial and Science Frontiers Magazine, bamboo wing-tips and twin pushers. Incidentally, I constructed my first model airplane at the age of eight (a Class A indoor glider, as I recall), while a member of the Stix, Baer & Fuller Model Airplane Club of St. Louis, Mo. I am still a very active modeler (mostly free flight and R/C) with a group of fellows at Douglas Aircraft Co., Long Beach, where I am employed as a Structural Engineer. In my *spare time* I am Squadron Leader of Air Explorer Sqdn. 120, B.S.A. I express my congratulations of your fine publication and urge you to continue in the progressive methods which have made for so much interesting and enjoyable reading in the past.

Martin L. Zellman, Jr., Compton, Calif.

Club Talk . . . Speaking for the rest of the club as well as myself, I would like to say that your magazine is without a doubt the finest mag in its field. Your expert coverage of contests makes for fine reading. Our club knows that the modelplane will last as long as boys crave good hobbycraft to work with, and good things to read—your mag will go on.

William Burrows, Delta Model Engineering Club, Forest Hills, N. Y.

Bomber with Windows? . . . Oh, come now, bomber with windows. . . . Just finished reading my July issue of AT (wouldn't be caught dead without the current copy each month), but the caption under your picture of PFC Mayfield's 4-engine U/C model of the Stratofreighter (C-97) refers to the model as a "4-engine U/C bomber model." Hope your caption writer is not one of our ADC Ground Observers! You folks are doing a nice job with AT, keep it up. How about some tips on full-size plans on one or two of these "Giants" like Mayfield tackled? Those of us who have been building models for years at times feel we have the courage to tackle a whopper, but find plans a bit scarce.

WOJG E. W. Kollender, USAF, Pope AFB, N. C.

P.S. Don't fire that caption writer, send him to the nearest USAF base for a refresher course in "Aircraft Recognition."

Sassy Saucer Still Streaking . . . Enclosed find 35c, for a set of full-size plans of the "Sassy Saucer" which appeared in your May 1953 issue. This is the first issue of your magazine that I have had the pleasure of reading and I think you have a very fine magazine. I have built a few models but I am still a beginner and your magazine has articles for the beginner as well as the expert.

Max Raynes, Lecta, Ohio

Now in School Libaries . . . I am very much pleased to learn that my books have been put on the approved list for purchase of schools throughout the U.S. As far as I know, they are the only books on model aviation on that list. Getting books on model aviation in the libraries of our schools is quite an achievement in itself and I do hope it will create more and more interest in model building.

Don Foote, Oakland, Calif.

For Enlarged Plans . . . In answer to Mr. Waddingham's question in your April issue, I would like to say that when a club desires enlarged plans of exceptional detail and accuracy the method outlined by Mr. Waddingham is entirely feasible.

I have done work of this type in the past, for clubs in various locations throughout the country, with very satisfactory results. Usually I am allowed to keep the reproduceable tracing and when the occasion arises that permits the sale of these plans the purchaser is paid a percentage of the sale price as partial remuneration for his cost. Plans are carefully drawn from manufacturer's prints and details from manufacturer's photos are added. Due to the fact that such data is usually unavailable to individuals, greater accuracy and additional detail are possible than would otherwise be attained.

An example: In 1951 this organization

(*Continued on page 8*)

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Buried in This Ad are most of the new items. Sometimes there isn't time or space to list all of them. But, if available anywhere, we have it.

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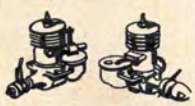

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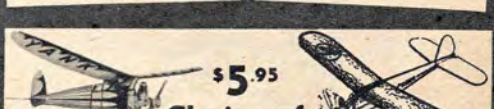

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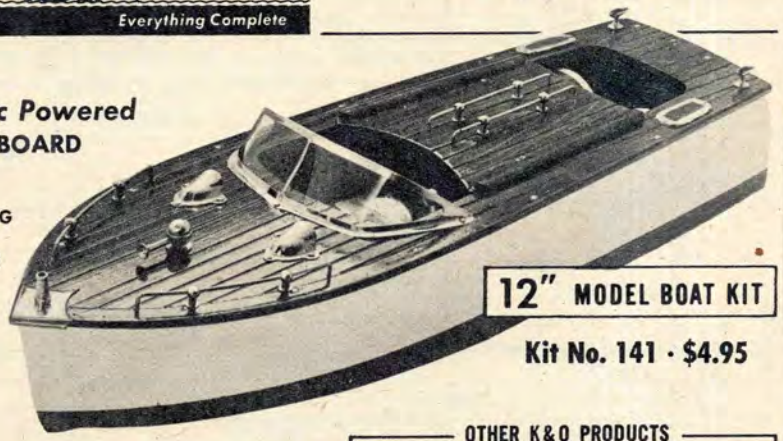

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The Shadow
Unusual adventures of a man whose dual existence is the nemesis of the criminal mind
A weekly mystery feature of the
Mutual
BROADCASTING SYSTEM
MBS

(Continued from page 4)

prepared exact scale plans of the Piper Pacer PA-20 at a cost of only five dollars to each member of the club retaining us. (The scale employed was one inch to the foot.) Since that time several sales of prints have reduced the cost, per individual, to only two dollars and ninety-three cents. The cost, however, if one person were to defray it, would be one hundred and seven dollars. This, subsequently, would have been reduced to only sixty-two dollars and seventy cents. The Pacer print mentioned is still available at a cost of five dollars per copy (including postage).

I must agree with you when you say that the cost to an individual is prohibitive. I do say, however, that the cost to a club is reasonable when all its members participate.

Robert R. Longo, Director,
Technical Publications Division,
LONGO-MAC DONALD, 4822A
Eastwood St., Wichita 17, Kans.

Helping the Teacher . . . I have before me a copy of Air Progress with a special section devoted to "Jet Aircraft of the World." There are also 1000 aviation illustrations showing the history of aircraft, etc. I do not know when this issue came out and would like to obtain a copy. I am a sixth grade teacher in the Pasadena, Calif. school system and one of my classes involves history and types of aircraft. I would appreciate your letting me know whether there are any copies available and where I might obtain them.

William G. Mehl, Monterey Park, Calif.

• Copies of Air Progress are available from Air Trails: 50¢ each in U.S. and Possessions, 60¢ in Canada, $1.00 elsewhere.

"Peculiar Planes" . . . In furtherance of a recognition training program sponsored by the Director of Intelligence, Headquarters, Eastern Air Defense Force, we would appreciate information concerning your "Peculiar Planes" or caricaturized drawings accentuating recognition features of aircraft.

We have found these caricaturizations most helpful in our recognition training program and would like to obtain, at no expense to the government, copies of these drawings that may have appeared in earlier issues.

Lt. High E. Ellis, USAF
Eastern Air Defense Force

His 1914 Kit in Museum . . . Regarding your article, "When They Really *Built* Model-planes" back in March, page 28, thought you'd be interested (and California readers) to know my complete kit, vintage 1914, of Ideal Nieuport (page 31) is on display in Los Angeles County Museum Hall of Transportation Aero Section. Was given to me in 1928 and I saved it ever since!! Quite a model, indeed.

Lt. G. E. Codding, USAF,
c/o APO, N.Y.C.

Plymouth Pilgrim . . . May I just congratulate you on your fine magazine. We now have a club, thanks to your Annual.

Phillip Sherman, Plymouth, Mass.

• Reader Sherman is referring to the article, "Start Your Own Model Club," in the Air Trails Model Annual for 1953. Letters like this and many others in the same vein just bear out ancient model-building saw: "Lone wolves don't have half as much fun and need twice as much moola."

Happy Birthday, Bob . . . I just bought my latest "A.T." and I have decided that I am through buying it at the newsstand—don't be alarmed, I mean I want a subscription. I am including a check for seven (7) dollars for my subscription and also for a gift subscription for my friend (and protégé) Robert Miller, who will be celebrating his eleventh birthday next week. I was in a quandary trying to decide what to give him. Then your ad on page 58 hit my eye. This is the perfect solution.

Bob Barton, Athens, Ga.

Lots of Letters . . . I once wrote to you asking for modeling pen pals to write to me. Since that time I have received goodness knows how many letters from different parts of America. I have made many friends and also been instrumental in forming friendships between other chaps with whom I fly models and the dozens of Americans who wrote to me . . . Anyway, I still receive occasional odd letters now and again that usually begin, "While looking through my back issues of Air Trails, I came across your letter, etc, etc." I guess I shall go on getting these letters when my little son is reading Air Trails, and he is only six months old now. My thanks to you are sincere if somewhat belated. May the circulation of Air Trails grow and grow.

F. Bell, Manchester, England

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Fastest speed in any British competition was achieved by Ron Davenport at '53 British Nationals with this Dooling .61 engine powered design. His speed: 158.7 mph; wt. 31 oz.

Walker's Flight Plan Meet Boon to F/F'ers

■ Dope Can's old friend Dallas Sherman, originator of the Pan American World Airways' PAA-Load event and currently Far East Regional Director for Pan Am, is one busy bird dog over there in Tokyo. Latest evidence of his activities are pictures of the N-52 Jap plane. The two-place lightplane was constructed by aero engineering students at Nihon University and is powered by a 65 hp Continental engine donated by—you guessed it—Dallas.

Elsewhere in this issue you'll see a photo of a genuine antique aviation trophy which Mrs. Sherman presented to her hubby after unearthing it in a Japanese curio shop. Dallas told us about it on his last trip to the States. It sounds like a fascinating gadget. The base is green marble. In one of the cylinders projecting from the base there's a Fahrenheit thermometer, in the other a centigrade job. The clock on the face is still in working condition. Dallas believes the affair to be of French origin.

Typical free flight by Eliot Horwich placed 2nd at G.B. "Nats". Timer operated auto-rudder, Amco 3.5 c.c. engine, 480 sq. in. wing. Balances at 95% chord; 17 oz. wt.; 15 deg. rt. sidethrust.

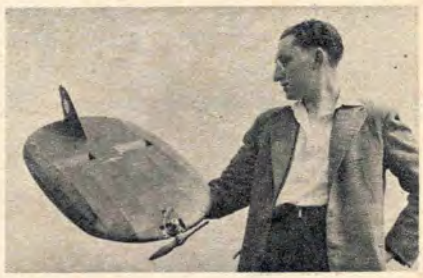
The world globe is brass with gold plating. Inside the globe a powerful spring operates the counter rotating props on the model through a series of gears and drive shafts. The prop motor, wound separately from the clock, has an endurance of about 6 hours.

An accurate reproduction of the Wright Model A airplane, the model atop the trophy is also brass with a plating of gold. About the only error my friend Sherman could detect is that the engine has only three cylinders, instead of four. The horizontal elevators in front and the vertical rudders in the rear both can be operated by levers at the seat position.

"As you probably know," writes Dallas, "a good many such trophies were 'liberated' by members of the Japanese armed forces in their wartime tours through Asia, and have since found their way into Tokyo antique shops. Maybe this is one of them. If so, and if your magazine can reach a claimant or rightful ownership, I will be pleased to hear from him and to consider ways and means of returning his trophy."

Lt. Atkins Reporting. That's your good friend, Dick Atkins, who authored the Douglas B-26 twin-engine USAF control line model in the '53 "AT" Model Annual. Dick's with the American military mission in Europe stationed at the Frescaty Air Base in France. He had a ten-day leave which he spent visiting with model builders in Holland. He contacted Mr. Van Der Caay in The Haag whose address was run in our May issue. Dick never did tell us what VDC's first name was. Oh, well.

Friends Atkins was surprised to discover that VDC is not only one of Europe's leading model builders, but he is also a noted organization and contest leader and president of the Aeromodeling Section of the Royal Dutch Aero Club—a job comparable to being president of the AMA over here. Van Der Caay heads up a technical committee with members from many nations which directs international competition; when Dick stopped by, Der Caay was working on rules for the International Team Racing contest which will soon come off in Holland.



Terry Badis of the Royal Air Force with his copy of Clough's "AT" Flying Saucer—enlarged 1½ times. Elfin 1.49 c.c. diesel provides power; wt. is 16 oz. Has tendency to fly inverted.

(Jim Walker should be ashamed of himself. Look at all the work he's causing good folk all around the world. Just think how peaceful all would be if Jim hadn't hooked up that first bellcrank!)

In discussing model building and modelers, Der Caay and Der Atkins came to the hard and fast conclusion that if more people were model minded we would have far less strife in the world today. Even in Europe where trouble always seems to be brewing, when modelers get together friendliness and cooperation become bywords. Language and politics are no barrier to (*Continued on page* 75)

Winner of PAA-Load at British Nats, Ken Glynn's Elfin 2.49 c.c. design. Area, 520 sq. in.; 65" span; 196 sq. in. stab; weight, 25 oz.; balance pt. at 80% chord. 3 max. 3-min. flights.

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HERE'S WHAT WINNERS AT THE '52 NATIONALS USED...

Paul Crowley travelled from Detroit, Mich., to win the PAA ½A Payload Jr. & Sr. with a PAA-Master. Prop: 6/3 Top Flite, Engine: Wasp .049.

Nat Antonioli, San Diego, Cal., took top honors in Cl. ½A Sr. with his Zeek, using a Wasp .049 with a 5¼/4 Power Prop. That big hunk of hardware on handsome Nat's right is the TOP FLITE perpetual trophy. He is holding the TOP FLITE Miniature, which he keeps permanently.

Chickasha, Oklahoma claims credit for Tommy Winton, who took the Control Line Combat Sr. with his All American, using a Fox 35 and a 9/6 Top Flite.

Bill Lofland, Abilene, Texas, is justly proud of his originally designed job that captured the Cl. C Sr. event. Bill wisely used a 10/6 Top Flite with a Torp 32.

That Stuka John Lenderman is holding made him a winner in the Control Line Precision Acrobatic Open. Johnny used a 10/6 Top Flite with a Fox 35 engine.

The ROW Open went to Elmer Scaggs and his Zeek. Elmer, a member of the U.S.A.F., used a Torp 29 with a 10/6 Top Flite.

Here's Bobby Jones of San Gabriel, Cal. Sorry we can't show you the "Bomb" that Bob used to win the Control Line Combat Jr., but we do know he used a 9/6 Top Flite on a Torp 19 power plant.

This proud builder is Thomas Dean, Corpus Christi, Texas. Tom's Great Lakes Trainer won the Control Line Flying Scale Open, using a 10/6 Power Prop on a Dooling 29.

What a team! Mr. & Mrs. Ray Randall, Colma, Cal., shown with their Grumman Sky Rocket. This happy couple took 1st place in the Navy ½A Carrier Control Line event. Engines: Wasp .049's; Props: 5¼/4 Power Props.

Here's Frankie Adams of Newark, Cal., with his All American Sr. Frankie stuck a 10/6 Power Prop on a Fox 29 to win the Control Line Precision Junior Acrobatic event.

A 12/6 Power Prop helped pull Kenneth De Gioiges' Sandy Hogan to victory in the Cl. B Sr. That plane looks about as long as Ken, who hails from Sacramento, Cal.

That's pride you see in Jack Smith's eye, Santa Barbara, Cal. His Amazon 400, pulled by a 10/6 Top Flite, won the Cl. B Open. Did you know that this plane was the only Nationals winner designed by a woman? Our congratulations to Sandra Hill.

12 yr. old Bruce Tune, Los Angeles Cal., looks starry-eyed as he holds his trophy. Bruce won the ROW Jr. with his Smarty, using a 6/3 Top Flite prop on a Torp .049.

Wally Short, Redlands, Cal., won the Cl. ½A Open with his AWOL (that's where his picture is!). Engine: Wasp .049; Prop: 6/3 Power Prop.

Young John Watson, Ft. Des Moines, Iowa, took 1st place in Cl. ½A Jr. Free Flight with his Half-Hay. A 5¼/3 Power Prop provided the pull, harnessed to a Torp.

Fran Uyematsu, Montebello, Cal., has no reason to frown at his Modified Cumulus. With a Torp 19 and a 9/6 Power Prop, this beauty won the PAA Load, Cl. AB Open.

The flashing smile belongs to D. N. Mallory, San Bruno, Cal. His Sophomore 29, powered by a Torp 32 with a 10/6 Top Flite, "brought home the bacon" in the Control Line Combat Open.

PAA Load, Cl. AB Jr.-Sr. honors went to Clinton Merrill, Oildale, Cal. Clint is shown here with his Crowbar . . . he used a 10/3½ Top Flite on an Arden 19.

Our sincere condolences to the parents of young Lawrence Miles of Medford, Oregon. Lawrence, winner of the Cl. B Junior event, passed away recently after a brief illness. He used a 10/6 Top Flite on his Modified Cumulus.

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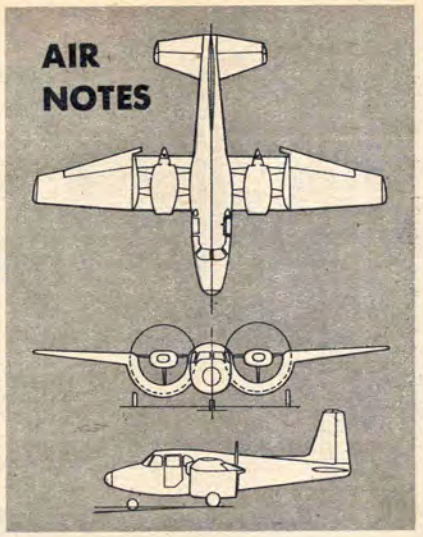


Custer Channel Wing Executive Transport Ready to Fly

AFTER many years of experimentation, Custer Channel Wing Corp. completed its first full-fledged aircraft. The CCW-5 (Custer Channel Wing, 5-place) uses the fuselage and tail surfaces of the Bauman Brigadier. According to William Custer, designer, the Channel Wing is not an airplane even though it attains greater speeds; neither is it a helicopter with all its mechanical problems, though it operates at comparable low speeds. Channel wing is an aircraft which "powers the air for lift and speed."

★ ★ ★

BOEING'S B-47 Stratojet bombers have made a number of impressive flights: Two B-47s of the 306th Medium Bombardment Wing crossed the Atlantic from Limestone, Maine, to Fairford, England, a distance of 3125 miles in 5 hrs. 38 min.; another one, piloted by Col. R. C. Neeley, made a round-trip flight from Fairbanks, Alaska, to the North Pole and return. Longest nonstop flight by a Stratojet covered a distance of 12,000 miles, taking 24 hours, during which the airplane was refueled three times in the air. . . . A new world record for loads carried by a single-engine airplane was set when a Douglas AD-4 Skyraider took off from the runway of Hensley Field, Dallas Naval Air Station, carrying a load of 11,944 lbs. or some 200 lbs. more than the basic weight of the airplane itself.

★ ★ ★

AEROJET-GENERAL Corp, has developed smokeless Jato. . . . ATOM BOMBS can be now dropped by Marine Corps planes. Two types fitted to carry the A-weapon are the McDonnell F2H-2B Banshee jet fighter and the piston-engine AD-4 Skyraider. Working in close cooperation with the "Atom Bombers" will be the Marine helicopters, that will "leapfrog" the hot areas carrying Marine combat infantry. . . . JACQUELINE COCHRAN became the first woman to fly faster than sound when she attained sonic speed at Muroc, Calif., flying a Canadian built F-86 Sabre powered by the Canadian Orenda engine. She also established a new speed record over 100 kilometer course of 652 mph. Previous record was 635 mph held by Col. Fred Ascani.

★ ★ ★

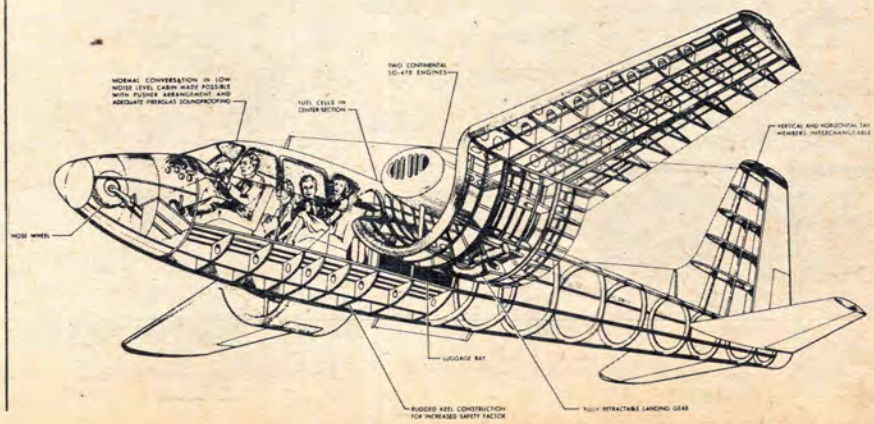
UNITED STATES aircraft hold all official air records at the present time. . . . DOUGLAS DC-7 made its maiden flight at Santa Monica, Calif. Plane is powered by four 3,250 hp Wright Turbo-Compound engines, can carry 60 passengers and has a top speed of 410 mph. Twenty-five DC-7's have been ordered by American Airlines and are scheduled to go into service this year. . . . A BRITISH Canberra twin-jet bomber powered by Britol Olympus jet engines reached an altitude of 63,668 feet. . . . LOCKHEED has fitted its F-94C Starfire all-weather interceptor with a new radome nose of pointed elliptical shape which gives the aircraft an additional 5 mph increase in speed.

★ ★ ★

NEW flight testing facilities costing $2,500,000 are being constructed by Northrop Aircraft Inc., at Palmdale, Calif. . . . PIPER has named its twin-engine personal plane, the Apache; it was formerly known as Twin-Stinson. . . . PHILIPPINES Institute of Science & Technology designed and built an airplane using bamboo for airframe covering. Known as Wobex (Woven Bamboo Experimental), the plane is a high-wing, strut-braced monoplane capable of carrying pilot and two passengers. It is powered by a 100 hp Lycoming engine. . . . BOEING's commercial jet transport, now in building stage, to be powered by Pratt & Whitney J-57 engines, same as in B-52. Plane expected to fly in mid-1954.

★ ★ ★

SWANK Western Hill Hotel in Fort Worth is first hostelry in U.S. to have its own heliport. . . . GEN. NATHAN F. TWINING succeeded as Chief of Staff of the Air Force General Hoyt Vandenberg. . . . REPUBLIC AVIATION CORP. extending its main runway at Farmingdale, L.I., from 4,500 ft. to 7,500 ft. to "take" F-84F Thunderstreak.



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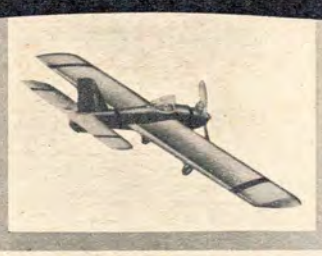

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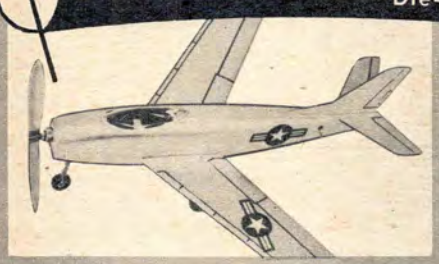

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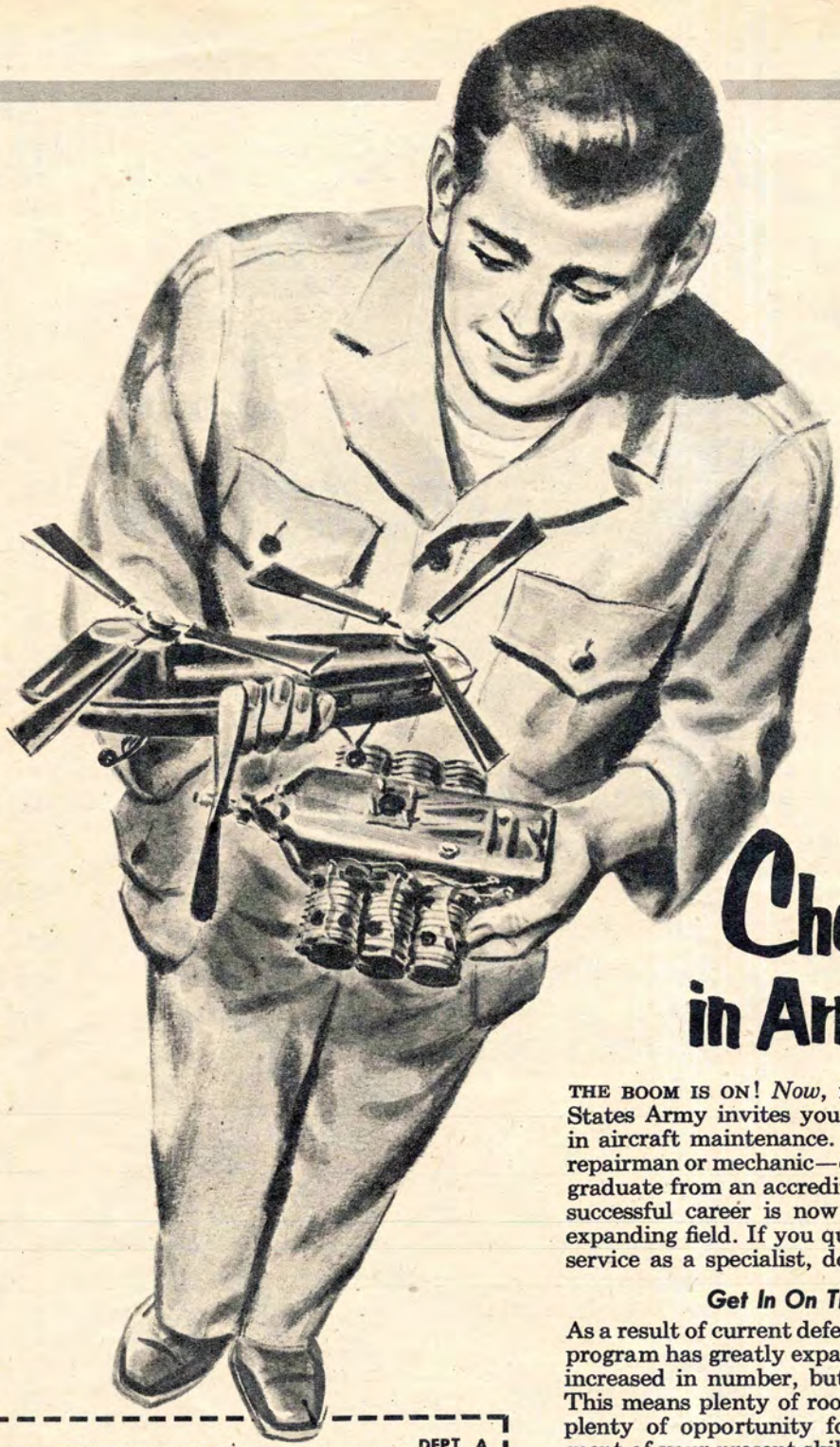

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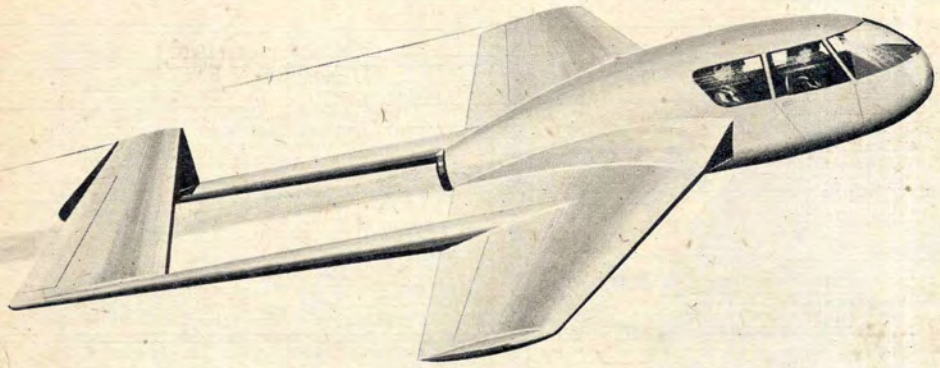
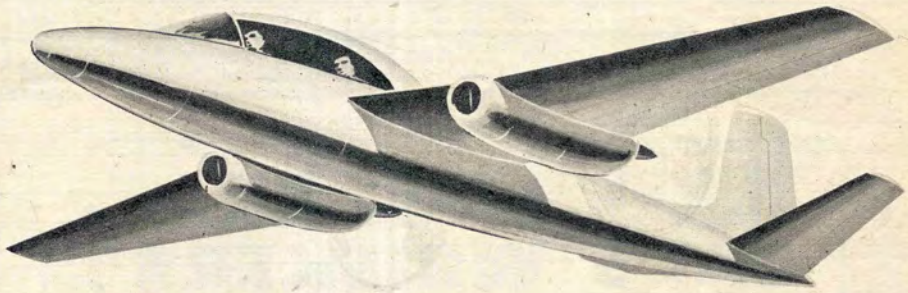
1ST AWARD
Four-Place Light Jet-Powered Plane



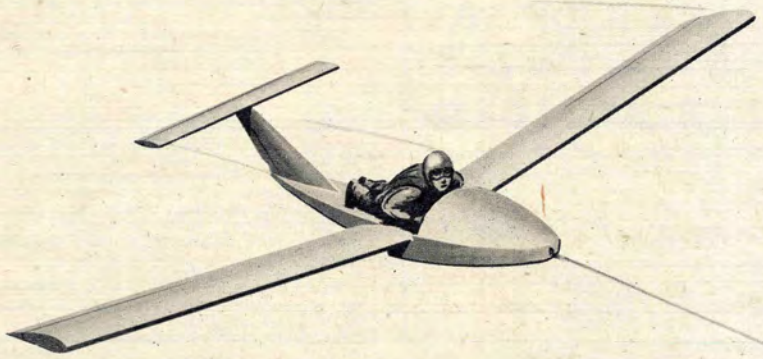
Tom F. Plese of Hawthorne, Calif., a Douglas Aircraft (El Segundo Div.) employee, submitted this interesting four-passenger jet airplane which features twin booms with inverted V tail. The arrangement keeps the entire tail area free from the heat of the engine exhaust, as well as from the influence of the wing wake. Powerplant is a small turbojet, under 1000 lbs. of thrust, which gives the plane a top speed in the neighborhood of 400 mph. Equipped with a tricycle gear. The wingspan is 37 ft.

2ND AWARD
Dolphin, Propeller or Jet Personal

Curtis J. Smith, Jr., who submits the design of this neat four-place personal plane called Dolphin, constructed it to float almost indefinitely in water in the event of ditching. It has integral gas tanks in wings which, when emptied, add to the plane's buoyancy. Additional gas tanks in the nose and behind passenger seats extend the range to nearly 3,000 miles. As a piston-engine craft it is powered by two 150 hp engines, but with some alterations these can be replaced with jets. Wingspan is 40 ft., and the top speed 185 mph.



3RD AWARD
Flying Surfboard, Amphibious Glider



An unusual design by Paul Austin Cheney of Rockville Center, N. Y., this amphibious glider has been suggested undoubtedly by the Wee-Bee prone lightplane. Here, also, the pilot lies down to fly, though we are afraid he will be subjected to water spray. Good design feature is the high location of the horizontal tail, to keep it dry on take-off. Lateral control is achieved by spoilers at wingtips, which are perforated to reduce stick loads; they can also be used to increase sinking speed for landing. Wingspan of the Flying Surfboard is 20 ft.

AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payment of $5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

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Official Rules

AMA

Control Line Flying Scale Regulations

These regulations were approved by the Control Line Flying Scale Rules Committee, Frank C. Smith, Chairman, and shall continue in their recommended status until further announcement by the AMA Contest Board.

GENERAL. Except as noted herein, all pertinent Official AMA Regulations covering contestant and model, as well as flight, shall be applicable.

POWER. Models shall be powered by internal combustion reciprocating engines of no more than 1.250 cu. in. piston displacement and jet engines having no more than 1.25 square inch cross-sectional area of tail pipe(s) at point of minimum cross-section. There shall be no size or power classifications for flying scale models.

CONTROL LINES. Line lengths shall be no less than those specified in the Official Regulations, according to the total piston displacement of the engines used in each model, except that where total displacement of engines is less than .100 cu. in., lines may be 35 feet long. Where total piston displacement is greater than .500 cu. in. or when jet engine(s) is/are used, lines shall not exceed 70 feet in length. Wire diameters as specified in the Control Line Precision Acrobatic Regulations shall be used for models weighing under 4 lbs. Models weighing 4 to 10 lbs. shall use a minimum wire diameter of .016 and those over 10 lbs. shall use a wire diameter of .020.

PULL TEST. A pull-test of 10 times the model's flying weight, with a maximum pull of 60 lbs., shall be made on models weighing under 10 lbs. Models weighing 10 lbs. or more shall withstand a pull test of 75 lbs.

SCORING. Competition points shall be given each contestant for fidelity to scale, workmanship and scale operation. Although no points are given for flight, each model must demonstrate its flying ability by flying at least 10 laps. Two attempts are allowed for completion of a successful flight.

MULTI-MOTORED MODELS. 15 points shall be given for each additional engine used, provided that during at least 50% of the flight, extra engine(s) is/are definitely contributing to increased performance of the model. Extra engine(s) must run a minimum of 10 laps to qualify for these points.

JUDGING. Each of the following items shall be judged individually and points awarded for each separately:

1. General appearance
2. Fuselage
3. Wing
4. Tail Surfaces
5. Landing gear
6. Engine and cowl. (Not including propeller. No metal propellers shall be used for flying.)
7. Color and marking

Points for each shall be awarded as follows:

(a) Fidelity to scale in all dimensions. (To be eligible for entry, each contestant *must* present an authentic 3-view print of his model. This print must be obtained from a commercial source. Hand drawn or home-made 3-views are not acceptable. Detailed 3-views of non-flying models such as Maircraft, Air Age, Inc., Wylam, McLarren, etc., are acceptable as are prints from model magazines providing the accuracy of the plan has been checked by the editors.)

Workmanship and fidelity to scale (each):

Superior	—21-25 points
Excellent	—16-20 points
Good	—11-15 points
Fair	— 6-10 points
Poor	— 1- 5 points

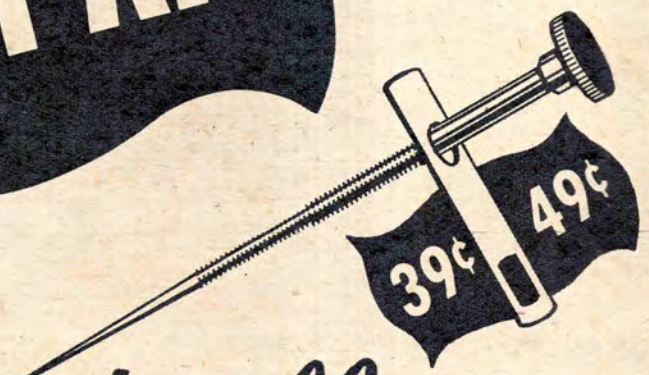
The total for both workmanship and fidelity to scale for each of the 7 items listed above shall be taken and the results added together to determine the scale appearance points of the model. No appearance points shall be used to determine contestant's standing unless the model has shown its flying ability by flying 10 laps. No changes shall be made between judging and flight which in the opinion of the judges would effect a change in the scale appearance.

SCALE OPERATION. These operations must be accomplished while the ship is flying. No points shall be given unless operation is complete (flaps must retract, bomb bay doors close, etc.).

a. Retract and extend landing gear	20 points
b. Raise and lower flaps	1-10 points
c. Revolve or move turrets (4 complete cycles of scale operation for maximum points)	1-10 points
d. Open and close bomb bay doors	1-10 points
e. Throttle control	1-10 points
f. Engine cut-off	1- 5 points
g. Demonstrate ability to taxi one complete lap and come to a dead stop at starting point	1-10 points

KAP-PAK

PRECISION PARTS



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test pilots' PILOT!

Ridin' herd on a stable of aerial bluebloods is easy compared to that initial flight in an old Jenny by the kid who hated flying

By VICTOR BOESEN

■ On a day in 1927, the year Lindbergh flew to Paris, one of the 4000 Jennys built during World War I climbed heavily out of Oakland, California, and headed creakily toward a new life at the little town of Willows, 120 miles due north.

In the second seat rode a kid of twenty who was possibly the only youngster of his age in the United States at the time who wasn't interested in aviation. This was his first trip up, and as he sat there in the throes of airsickness, he was darn sure it was his last. He was a country boy, and vastly more to his fancy were the things of the farm: rice growing, sheep ranching, hunting, and fishing.

But these interests, indirectly, were what had got him into the cockpit where he now rode. Raising sheep and rice, he made money. Hence, when a group of non-farming youngbloods around the neighborhood formed a flying club, they craftily counted him in; he was the only one among them who had the $525 to put down for the Jenny. And, since it was his money, it had been thought only right that he should have the honor of riding the ship home to Willows from Oakland.

This incident in the life of Johnny Martin is noteworthy because of the decisive extent to which he overcame his antipathy for flying. Today, looking like a smoothed-out Humphrey Bogart, Martin is chief test pilot for the Douglas Aircraft Company. As such he rides herd on a stable of forty-odd of his own kind, scattered between Douglas plants at Santa Monica, El Segundo, and Long Beach, California; Tulsa, Oklahoma, and Douglas projects at the Edwards Air Force Base in California's Mojave Desert, who comprise as elite a group of pilots as you'll find anywhere in the world.

The transfiguration of Johnny Martin that led to this estate began, for all the sickness and misery of it, during that ancient two-hour ride from Oakland to Willows. Deep down under the nausea and fear there stirred a faint exhilaration at the experience. When he arrived home, he read the instruction book. The fact that while this got him off the ground on his own in good shape, but not back to earth in the best of condition, was no

One of Martin's charges is the world's fastest airplane, the Douglas Skyrocket, in which Bill Bridgeman hit a speed close to 1300 mph.

discouragement. He went on to what under the circumstances could be called advanced training: he took some lessons.

Eventually gaining such domination as was possible over the Jenny, the first of several ships he was to own or have an interest in, he found many things to do with an airplane. He planted rice with it, dusted the crop for bugs, hunted coyotes, and chased ducks and eagles. He barnstormed, and did charter work.

Then came a crisis. He was flying a party of guests out from the late W. R. Hearst's San Simeon estate, and lost his way in a heavy overcast. Near Mount Shasta, dropping under the soup, he found a Forest Service airstrip, and sat down on it. He put his passengers on a bus, and had himself two days of meditation on his future while he waited for the weather to clear.

Back to the rice paddies, or learn instrument flying, without which he had already gone too far? His decision went to the instruments, then known to practically no one except commercial pilots.

He enrolled at the Boeing School of Aeronautics, Oakland, taking not only instruments, but engines and everything else needed to advance himself. The schooling paid off with a Government contract to fly the weather—remember those flying weather men of the Thirties?—and then several years with United Airlines. In 1940, he went with Douglas as a test pilot.

The men he found there had come with similar backgrounds of experience. All Douglas test pilots have had either military or airline experience, or both. Most have been to college, with many of the newer men holders of university degrees; and to an extent each is an engineer-scientist as well as a pilot.

How all this adds up may be judged from the fact that, although testing airplanes is supposed to be dangerous work, these boys haven't had a fatal accident in ten years, while flying more than one million hours. Much of this time, be it noted, is in purely experimental ships—ships that were never off the ground before, and super-hot ones of radical character like the Skystreak and Skyrocket.

There are about thirty-five experimental ships on the fire at all times, absorbing a third to a half of the total flight time. Production jobs, every last one of which must be flown, four to five hours each for the smaller ships, six to seven hours each for the four-engine craft, account for the rest of the time.

And trying out a modern airplane calls for considerably more than simple airmanship. "You don't just put the nose down and see if the wing'll come off," Johnny Martin points out. With maybe a dozen million dollars in a new ship, that concept of testing is as archaic as the old Jenny. Besides, it wouldn't tell you much. On the DC-6, for example, there are 124 items to check, each listed on a sheaf of check sheets. Not included is whether the wing will come off. That it won't is one of the few things they have reached the point nowadays of determining beforehand in most cases.

Each item is checked to a hairline tolerance. The landing gear goes down in nine seconds? Not good enough; seven seconds is the mark. The flaps must retract from 20-degree take-off setting to zero in thirteen seconds, plus or minus two, no more.

If you'd like to join the select group who do this work, here are the requirements. You must be a graduate either of a Navy or Air Force flight school, or a civilian equivalent. You must be young. "I want the youngest I can get," Martin stipulates. This means around

twenty-five years old. Before that you aren't likely to have had the experience Martin requires. This is 2500 hours, broken down as follows: 500 hours of twin-engine time, 200 hours of four-engine time, and 50 hours on jets. This much may get you an interview.

If you survive this, there is a four-day physical examination, more detailed and rigid than for combat pilots and that of the CAA. Stressed are the condition of the heart, teeth, and blood.

But you're still not in, and it may be three months before you know where you stand. It takes that long sometimes for the various security agencies to finish up with you. Then, if at last the answer is yes, you must demonstrate that you have an innate skillfulness and basic common sense. Possibly influenced by what the printed word of instruction did for him and the Jenny, Martin dislikes "slip-stick artists,' who tend to fly too much by the book. Which kind a man is, Martin can easily tell.

"If he has done a lot of flying without getting into trouble," Martin reasons, "he must have something between the ears, whether or not he's from M.I.T."

Likewise important is an agreeable personality. Spawning a modern airplane calls for teamwork of the closest kind, from the drawing board to the flight strip. It goes better if all, including the pilot, get along with one another. And the pilot must have the capacity, as Martin says, "to be talked to." The day of prima donnas, who hold themselves above mere groundlings, is past.

Moreover, having been talked to, the pilot must have the discipline to hold strictly to what he is told. On this

With Martin in the cockpit of a DC-6B is his lovely wife Dori, a former movie actress who during the war served as a WASP squadron commander. She also participated in 1947-1948 Cleveland Air Races.

G-man! Johnny volunteered to serve as human guihea pig when University of So. California developed the centerfuge for testing a pilot's G-tolerance. He took five G's for 17 seconds before "graying out."

can hang lives, millions of dollars, even the nation's security. When he takes up an experimental ship, each thing he is to do, and in what sequence, is carefully worked out and agreed on before the take-off. Thus, if anything goes wrong, the presumption of fault is on the ship, not the pilot.

The story is told of one irrepressible fellow who impulsively gave the rudder an unscheduled kick during a high speed run. The resulting crimp in the fin gave him away after he landed. He is selling used cars now.

If the ship had been lost, the pilot along with it, it could have taken millions of man-hours to find out that there was nothing wrong with the tail, and that the fault lay with the pilot, who until then would be presumed to have followed instructions. In wartime, such delay could be disastrous.

For the same reasons that obedience to instructions is paramount, Johnny Martin must know his men—each man's special abilities, how his mind works, what, if anything, is eating him. There is extra money in flying the brand new ideas, but that (*Continued on page* 61)

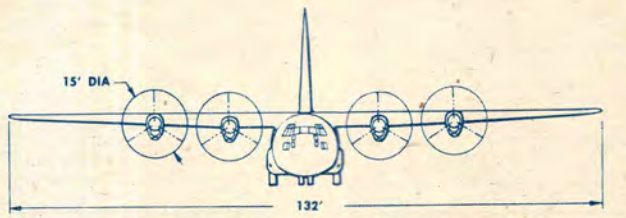
Air FORECAST and REVIEW

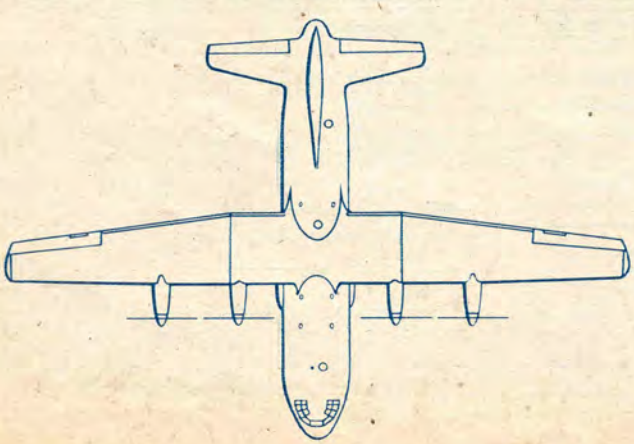
North American's Sabre 45, the new F-100, made first flight in fine fettle. But don't believe reports that plane went supersonic on initial hop; that's some time away yet. Design features: 45-degree sweep, Pratt & Whitney J57 with afterburner good for about 15,000 lb. thrust, gross weight around 25,000 lb. . . . Carrier suitability tests are the next set of hurdles for McDonnell's F3H Demon. Production is underway, deliveries begin later this year. Recognition points: huge air intakes, droop-snoot leading edge, variable-incidence tail, high "beavertail" fairing to keep flow smooth at vertical-horizontal tail intersection. Engine—if they can get them—is Westinghouse J40. Prototype photos seem to show two tailpipes, hint at use of two alternate engines because of J40 problems. . . .

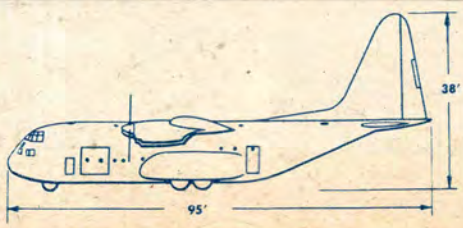
In England, Vickers F.4 Swift with afterburner made first flight. New version of RAF production fighter has four 30-mm cannon, flew only few weeks ahead of rival Hawker Hunter with afterburner. Intense competition between two craft for orders and fame. . . . Lightweight Gnat flies in one year, will settle some problems of light fighter. Design is for Folland (England) by Petter who developed Canberra. Gnat weighs in at 5,350 lb. Speed is sonic, operational ceiling over 50,000 ft., and rate of climb a whistling 15,000 fpm. Tiny wingspan (20 ft.) and 40-deg. sweep characteristic wing layout. Armament is pair of 30-mm cannon. Petter says cost could be one-fourth that of Hunter or Swift. . . . Last Douglas piston-engined transport—DC-7—now in the air. "Fastest and most powerful Douglas transport" is safe claim by company. Difference from DC-6B: new Wright Turbo Compound engines, titanium in nacelles, minor changes. Paint job on fin says DC-7. Recognition hint: Look for four-bladed props.

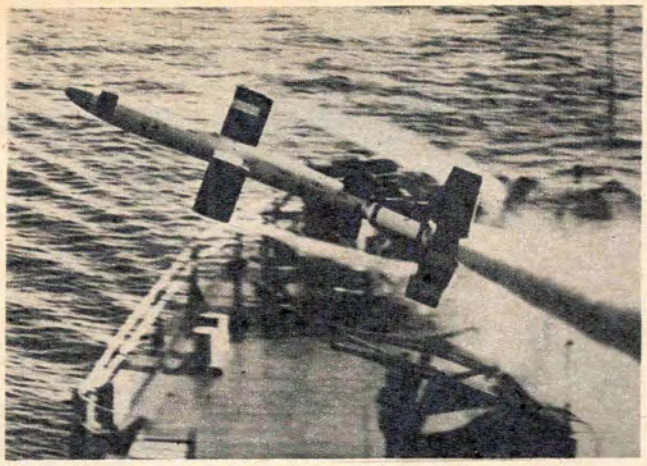
New Designs: *Variable-incidence wing* is novel feature of new Chance Vought Navy day fighter which won competition over seven other firms. Layout will be conventional; C-V engineers want no more of the tailless idea. P&W J57 with afterburner is powerplant. Navy could get this for flight tests by end of 1956 if they order soon. . . . *Autogyros* are back in limelight again, being pushed hard by Nagler Helicopter Corp. Idea is attractive because of inexpensive rotor system, and because addition of cheap, expendable rocket powerplants gives vertical take-off characteristics of copter. Nagler foresees big swing to 'gyro, is readying conversions of Aeronca and other lightplanes, developing four-place personal craft. Also in works: one-man strap-on Heliglider, for new Army idea of every man with his own mount. . . . *Custer Channel Wing* has been tested in NACA full-scale tunnel and found wanting. Does not live up to claims of inventor. NACA found: lack of control at low speeds, inability to hover, impossible to fly on single engine, poor flow through props and channels, lift-drag ratio of 1.7 instead of conventional values around 8 to 12. . . . *Lowered horizontal tail* is new design

The Lockheed C-130 is the first USAF turboprop Assault cargo transport. It was especially designed for a variety of operations ranging from short assault missions to transoceanic flights. Its four turboprop engines are capable of delivering 5500 hp each and it can carry a load up to 20 tons. Prototype is now under construction.

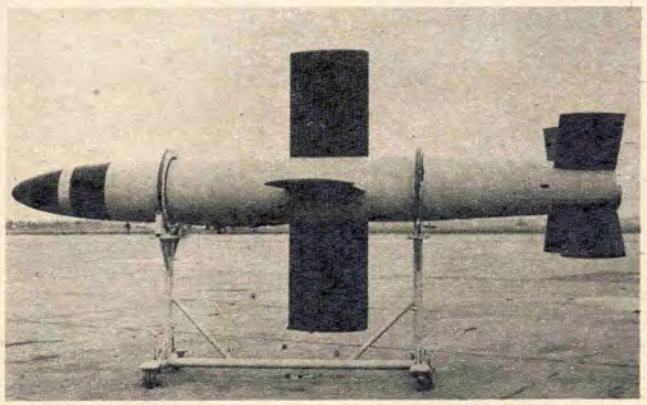


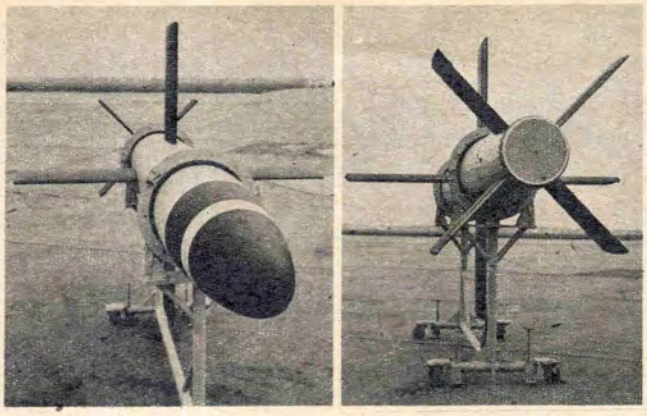




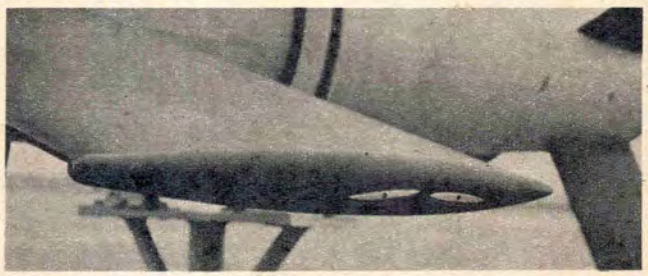


ANTI-AIRCRAFT MISSILE





Capable of outmaneuvering the most agile fighter, the Lark is an anti-aircraft missile designed by Fairchild Engine & Airplane Corp.'s Guided Missile Division. It is powered by a liquid rocket motor and uses additional Jato for launching. Currently Larks are being flown by all three branches of the armed services in their test and training programs. Span of wings is 6 ft. 3 in., tail span 4 ft., body length 13 ft. 11 in. Dia. 1.5 ft. left: Lark launched from USS Norton Sound.



trend for high-speed craft. Designers used to locate tail high to get it out of wing wake; now tests show that below fuselage centerline is better spot to avoid aerodynamic faults, such as snaking.

Salute to ARDC: Air Research and Development Command is young brother of Air Force, has big ideas and big abilities. Command operates nine development centers in U.S., will soon have tenth in full swing. Centers do R&D work on everything from aerodynamics to zirconium; pit man against high altitudes; shoot missiles against drones; sample atomic bomb clouds. Preparation for tomorrow's airplanes is ARDC's mission; thus, job covers complete range of subjects. Among super-size test apparatus to do the job: world's largest supersonic tunnel (16 by 16 feet); 1,500-mi. missile test range based in Florida; seven-mile runway at Edwards flight test center. Big difficulty: convincing people that basic research and development is important. With no hardware to show, ARDC has tough time competing with production lines. And best products —the future airplanes—are yet to come.

Missile Mish-mash: Services are squabbling again over control of missile types. In Britain, similar fuss was resolved by giving entire program control over to RAF. Same idea has been suggested here. . . . New twist: Bendix-Pacific will remodel your old missile with a new line of packaged goods. Guidance, intelligence, hydraulic systems or instruments can be bought to fit your special project, bring it up to contemporary performance of the competition. Idea could be used to extend life of training missiles.

Boeing B-47 Fixes continue, and latest adds vortex generators to top of wing. These are tiny vanes set spanwise on wing from tip to semispan. Job: to prevent flow breakaway at high speed, increase speed capability.

Prediction: Watch for renewed interest in the *free balloon*. It can serve as high-altitude test vehicle, can be produced cheaply. New plastic materials make light, expendable bag. Possible uses: carry men to extreme heights (100,000 ft.) for tests; photography; launching missiles.

Parasite Fighters: Back again is new scheme to attach fighters to wingtips of heavy bombers. Refueling and rearming are possible with arrangement. Collision between F-84 and B-29 over Long Island happened during tests of new system. Idea makes more sense than filling bomb-bay with fighter instead of bombs, could be applied to missile launching techniques.

Budget Casualties: Chase C-123, Lockheed T-33 and Beech T-36. Cutbacks are scheduled for these, says Defense Sec. Wilson. About 200 B-47s will also be axed. . . . Boeing B-52 gets nod for high-quantity production, though, with "several hundred" ordered. Former total was less than 100.

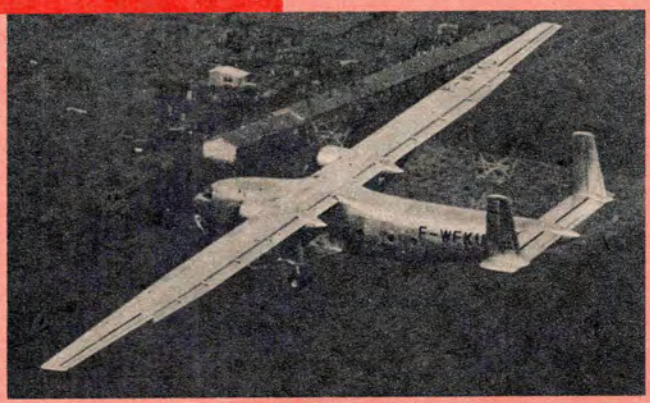
Copters: Piasecki sees 170 mph top speed for conventional copters, may make attempt on world's record currently held by Sikorsky S-52 with 129.47 mph. . . . Sikorsky S-58 is new anti-sub copter based on S-55, will use four-blade rotor. S-56 is designation for new Marine assault transport featuring five-blade rotor.

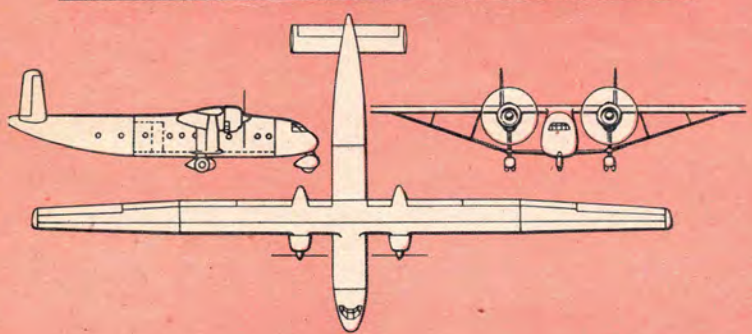
Reds Fly Sabres, despite official denials. Combat pilots in Korea have seen them on rare occasions flying as one plane in Red element. Significance: Reds have our excellent gunsight.

Champ Lifter: Douglas Skyraider. Able Dog of the Korean war has lifted useful load in excess of its own basic weight. Take-off gross was up around 24,000 lb. for the flight. Match that!—*DAA*.

North American F-86H, fifth and latest in the series of Sabres. Power considerably more.

The World A-Wing

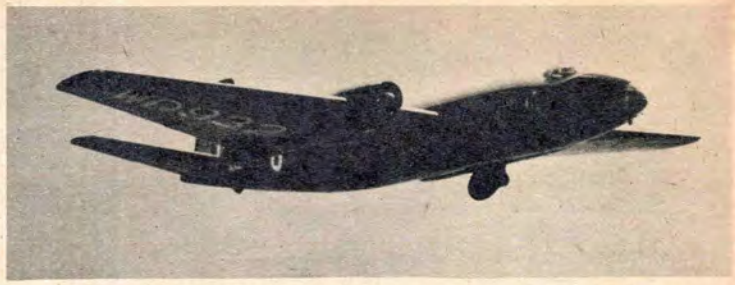




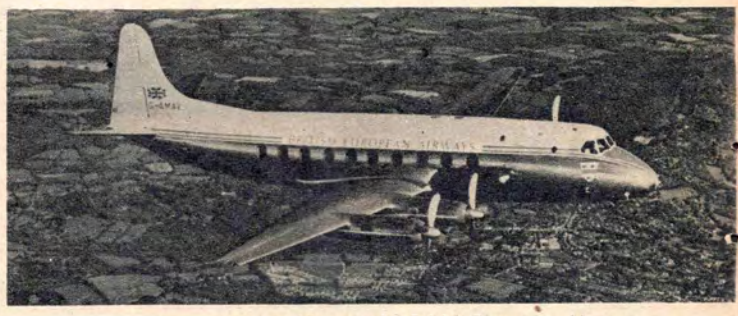
Hurel-Dubois HD-31. Long, narrow wing has an aspect ratio of 20.2, and in combination with flaps and lift struts is capable of carrying large loads at high speed of 175 mph, with low landing speed of 62.

French convertible aircraft, SO-1310 "Farfadet." Turbomeca Arrius jet engine supplies jet rotors with compressed air; Turbomeca Artouste turboprop supplies power to propeller. Each rated 360 hp.

Spain's second airliner design, C.A.S.A. 202 Halcon. Plane carries 14 passengers and a crew of three. Powered by two 9 cylinder 750 hp Elizade engines. Wing span is 70' 9"; maximum speed 192 mph.



Canberra; RAF entering 3, Australian AF, 2.



Vickers Viscount by British European Airways.

Danish AF will fly Republic F-84G Thunderjet.

"Slick" Goodlin, USA, will pilot DH Hornet.

World War II Trio: Focke-Wulf Fw 190

You'll want to add this ¾" version of the famous German WWII fighter to your control line flying scale collection—also the F4F-4 and Hawker!

■ Like the Messerschmitt 109, the Focke-Wulf 190 was a small fighter by modern American and British standards, spanning only 34 feet as compared with the 38 to 44 foot spans of comparable Allied craft.

Designed around the air cooled B.M.W. 801 twin-row radial engine, the "190" is an outstanding example of close engine cowling. Kurt Tank utilized an ingenious cooling system whereby a multi-bladed fan in the nose opening controls the airflow passing the cylinders. A sliding ring controls the air exit. Air was supplied to the supercharger via a duct or blister on each side of the cowl. The oil cooler formed the circular leading edge of the cowl ring and was armored to protect the oil system.

The 1600 hp of this engine propelled the fighter to a maximum speed of 390 mph. With a ceiling of 36,000 feet the normal range was 500 miles, which could be extended with the aid of a jettisonable belly tank. Weight of this plane was 8580 lbs. Armament consisted of four 20-mm. cannon in the wings plus two 7.9-mm machine guns imbedded in the upper cowl firing through the propeller arc. Bomb load started at 1,000 lbs. and by the end of the war the Fw 190 was loaded with 4,000 lbs. for fighter-bomber strikes!

Making its appearance in September of 1941, the Focke-Wulf was designed to meet the requirements of the cold weather on the Russian front which was proving troublesome to the standard liquid-cooled engines. Another reason for its development was to fully utilize the air-cooled engine production of B.M.W. as well as to assist the Me 109 in its struggle against the increasing strength of Allied air power. Unlike the earlier German fighters the Fw 190 was well armored for both pilot and powerplant protection.

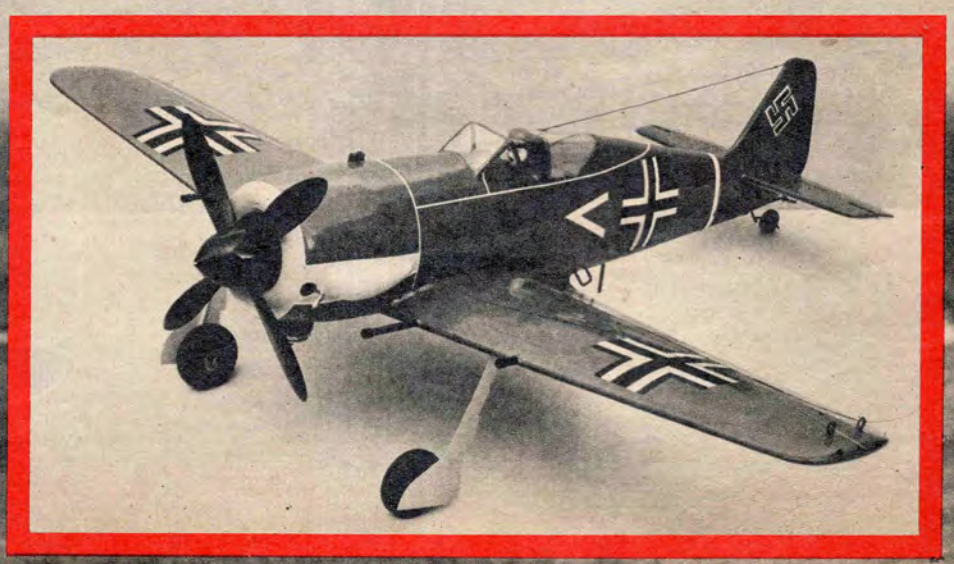
Some of these craft were used by Japan and were nicknamed "Fred" by Americans.

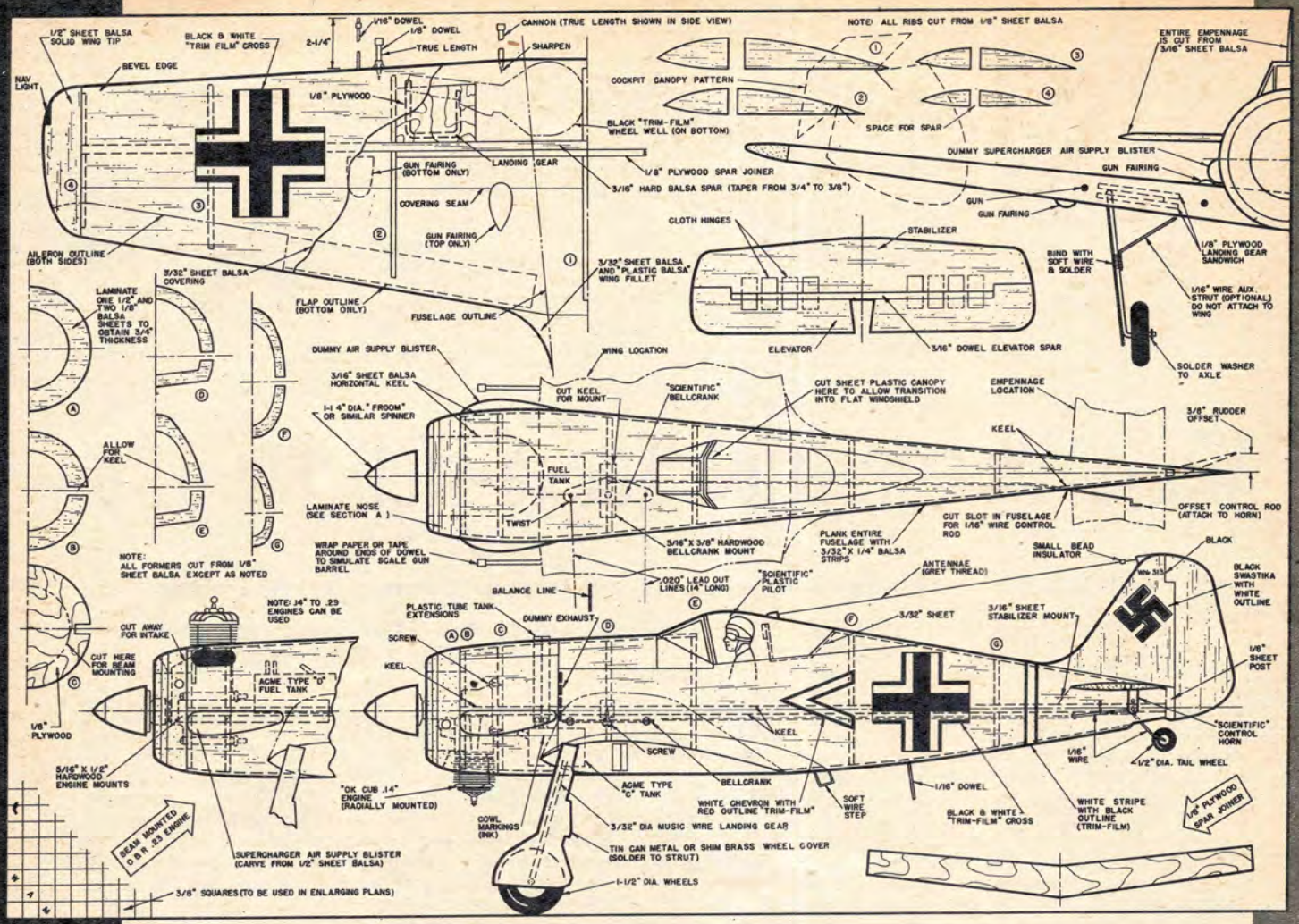
Built to the scale of ¾" equals 1', our model will accommodate engines from .14 to .29 cubic inch displacement. We used the Cub .14 with considerable success. With this powerplant and planked fuselage plus a very simple wing structure the completed model weighed 18 ounces ready to fly.

The sheet balsa horizontal keel and the fuselage formers are cut out with single-edge razor blade and the formers are cemented to the top and bottom of the keel. It should be decided now as to the type of engine to be installed because this (*Continued on page* **74**)

By WALTER MUSCIANO

You can color your Fw 190 as detailed by WM, or follow Cal Smith's drawing on the cover.




1/2" SHEET BALSA SOLID WING TIP
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BEVEL EDGE
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2-1/4"
CANNON (TRUE LENGTH SHOWN IN SIDE VIEW)
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GUN FAIRING (BOTTOM ONLY)
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3/32" SHEET BALSA COVERING
FLAP OUTLINE (BOTTOM ONLY)
FUSELAGE OUTLINE
LAMINATE ONE 1/2" AND TWO 1/8" BALSA SHEETS TO OBTAIN 3/4" THICKNESS
ALLOW FOR KEEL
NOTE: ALL FORMERS CUT FROM 1/8" SHEET BALSA EXCEPT AS NOTED
NOTE: ALL RIBS CUT FROM 1/8" SHEET BALSA
COCKPIT CANOPY PATTERN
BLACK "TRIM-FILM" WHEEL WELL (ON BOTTOM)
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SPACE FOR SPAR
ENTIRE EMPENNAGE IS CUT FROM 3/16" SHEET BALSA
DUMMY SUPERCHARGER AIR SUPPLY BLISTER
GUN FAIRING
GUN
GUN FAIRING
CLOTH HINGES
STABILIZER
3/32" SHEET BALSA AND "PLASTIC BALSA" WING FILLET
ELEVATOR
3/16" DOWEL ELEVATOR SPAR
BIND WITH SOFT WIRE & SOLDER
1/8" PLYWOOD LANDING GEAR SANDWICH
1/16" WIRE AUX. STRUT (OPTIONAL) DO NOT ATTACH TO WING
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WING LOCATION
CUT KEEL FOR MOUNT
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EMPENNAGE LOCATION
3/8" RUDDER OFFSET
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FUEL TANK
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LAMINATE NOSE (SEE SECTION A)
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ACME TYPE "O" FUEL TANK
SCREW
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3/16" X 1/2" HARDWOOD ENGINE MOUNTS
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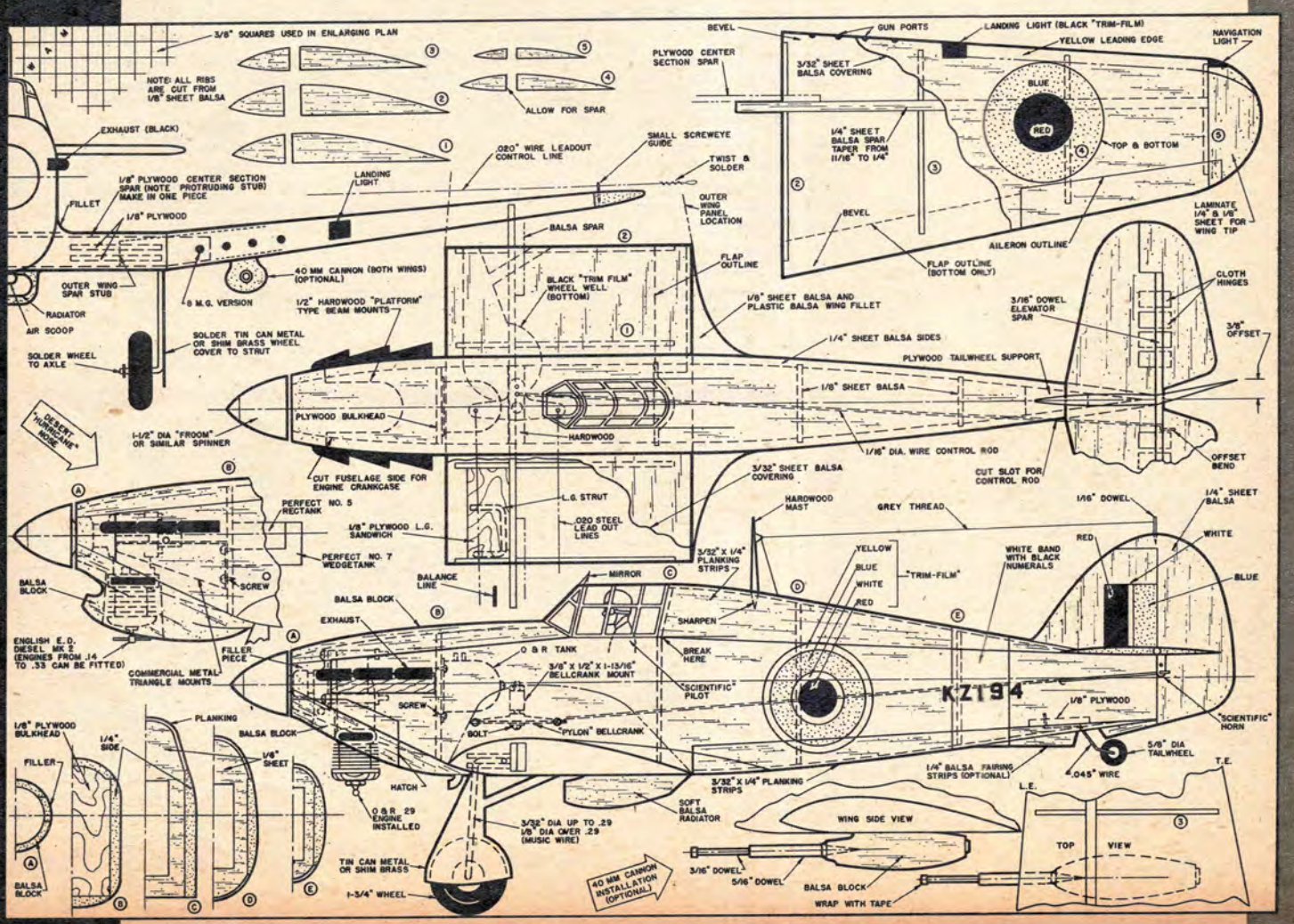
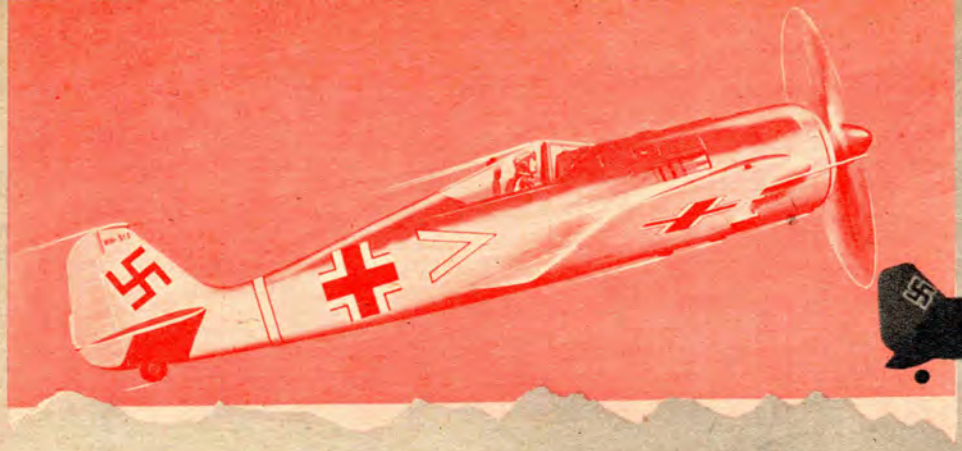
3/32" DIA MUSIC WIRE LANDING GEAR
TIN CAN METAL OR SHIM BRASS WHEEL COVER (SOLDER TO STRUT)
1-1/2" DIA. WHEELS

FOCKE-WULF Fw 190



HAWKER HURRICANE



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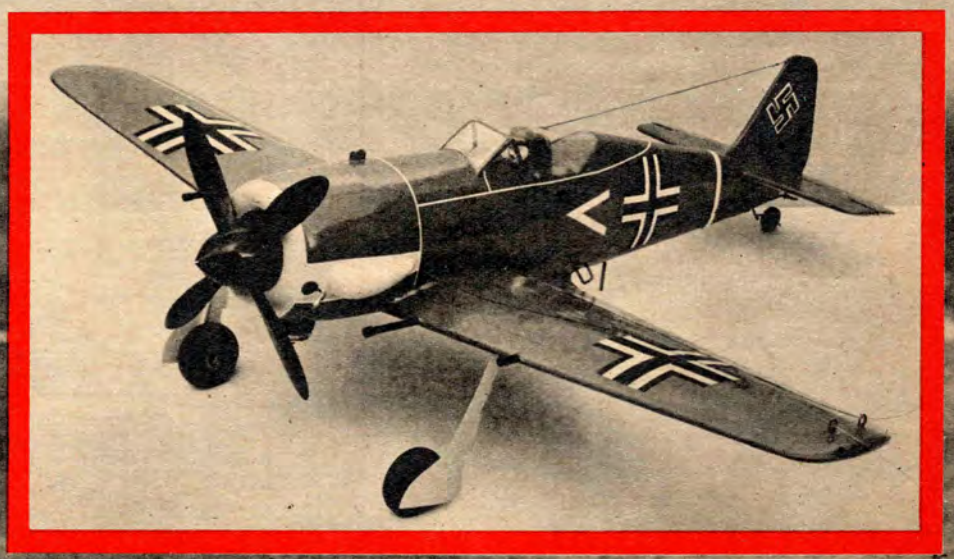

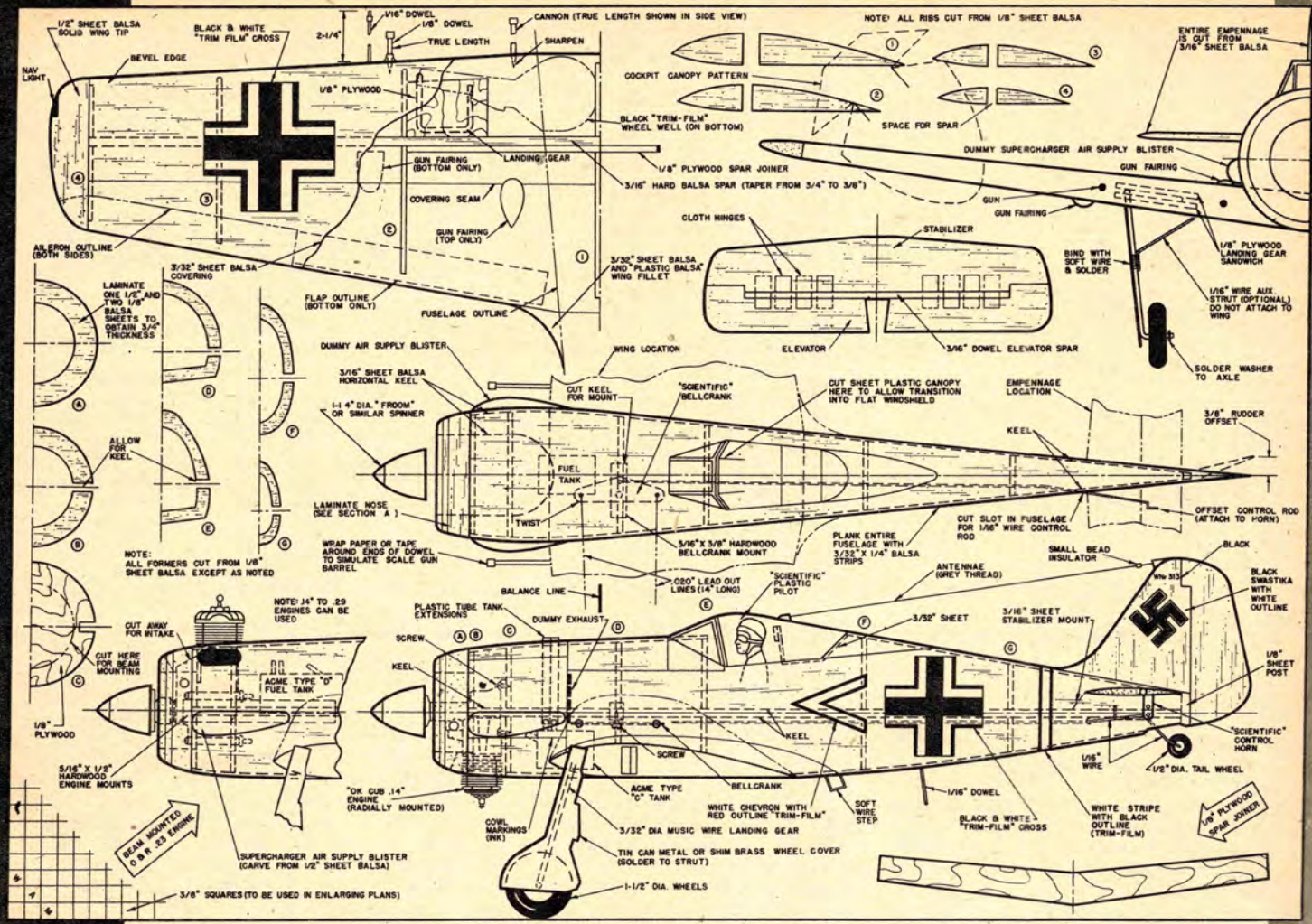
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SUPERCHARGER AIR SUPPLY BLISTER (CARVE FROM 1/2" SHEET BALSA)
COWL MARKINGS (INK)
3/32" DIA MUSIC WIRE LANDING GEAR
TIN CAN METAL OR SHIM BRASS WHEEL COVER (SOLDER TO STRUT)
1-1/2" DIA. WHEELS
3/8" SQUARES (TO BE USED IN ENLARGING PLANS)
BLACK & WHITE "TRIM-FILM" CROSS
WHITE STRIPE WITH BLACK OUTLINE (TRIM-FILM)
1/8" PLYWOOD SPAR JOINER
HAWKER HURRICANE
3/8" SQUARES USED IN ENLARGING PLAN
NOTE: ALL RIBS ARE CUT FROM 1/8" SHEET BALSA
ALLOW FOR SPAR
EXHAUST (BLACK)
020" WIRE LEADOUT CONTROL LINE
SMALL SCREWEYE GUIDE
TWIST & SOLDER
1/8" PLYWOOD CENTER SECTION SPAR (NOTE PROTRUDING STUB) MAKE IN ONE PIECE
LANDING LIGHT
FILLET
1/8" PLYWOOD
OUTER WING PANEL LOCATION
BALSA SPAR
OUTER WING SPAR STUB
40 MM CANNON (BOTH WINGS) (OPTIONAL)
8 M.G. VERSION
1/2" HARDWOOD "PLATFORM" TYPE BEAM MOUNTS
FLAP OUTLINE
BLACK "TRIM FILM" WHEEL WELL (BOTTOM)
1/8" SHEET BALSA AND PLASTIC BALSA WING FILLET
RADIATOR
AIR SCOOP
SOLDER TIN CAN METAL OR SHIM BRASS WHEEL COVER TO STRUT
SOLDER WHEEL TO AXLE
1/4" SHEET BALSA SIDES
PLYWOOD TAILWHEEL SUPPORT
1/8" SHEET BALSA
DESERT "HURRICANE" MODEL
PLYWOOD BULKHEAD
1-1/2" DIA "FROOM" OR SIMILAR SPINNER
HARDWOOD
1/16" DIA. WIRE CONTROL ROD
CUT FUSELAGE SIDE FOR ENGINE CRANKCASE
3/32" SHEET BALSA COVERING
L.G. STRUT
020 STEEL LEAD OUT LINES
PERFECT NO. 5 RECTANK
1/8" PLYWOOD L.G. SANDWICH
PERFECT NO. 7 WEDGETANK
SCREW
BALSA BLOCK
BALANCE LINE
MIRROR
EXHAUST
SNARPEN
ENGLISH E.D. OSEDEL MK 2 (ENGINES FROM .14 TO .33 CAN BE FITTED)
FILLER PIECE
COMMERCIAL METAL TRIANGLE MOUNTS
O & R TANK
3/8" X 1/2" X 1-13/16" BELLCRANK MOUNT
BREAK HERE
"SCIENTIFIC" PILOT
SCREW
BOLT
"PYLON" BELLCRANK
1/8" PLYWOOD BULKHEAD
PLANKING
1/4" SIDE
BALSA BLOCK
FILLER
1/8" SHEET
HATCH
O & R 29 ENGINE INSTALLED
3/32" DIA UP TO .29 1/8" DIA OVER .29 (MUSIC WIRE)
TIN CAN METAL OR SHIM BRASS
1-3/4" WHEEL
SOFT BALSA RADIATOR
3/32" X 1/4" PLANKING STRIPS
40 MM CANNON INSTALLATION (OPTIONAL)
3/16" DOWEL
5/16" DOWEL
BALSA BLOCK
WRAP WITH TAPE
WING SIDE VIEW
TOP VIEW
T.E.
L.E.
1/4" BALSA FAIRING STRIPS (OPTIONAL)
.045" WIRE
5/8" DIA TAILWHEEL
"SCIENTIFIC" HORN
1/8" PLYWOOD
K2194
YELLOW
BLUE
WHITE
RED
"TRIM-FILM"
WHITE BAND WITH BLACK NUMERALS
HARDWOOD MAST
GREY THREAD
1/16" DOWEL
1/4" SHEET BALSA
WHITE
RED
BLUE
CLOTH HINGES
3/8" OFFSET
OFFSET BEND
CUT SLOT FOR CONTROL ROD
3/16" DOWEL ELEVATOR SPAR
LAMINATE 1/4" & 1/8" SHEET FOR WING TIP
AILERON OUTLINE
FLAP OUTLINE (BOTTOM ONLY)
TOP & BOTTOM
1/4" SHEET BALSA SPAR TAPER FROM 11/16" TO 1/4"
BEVEL
3/32" SHEET BALSA COVERING
PLYWOOD CENTER SECTION SPAR
BEVEL
GUN PORTS
LANDING LIGHT (BLACK "TRIM-FILM")
YELLOW LEADING EDGE
NAVIGATION LIGHT
BLUE
RED

From the Battle of Britain to desert warfare at El Alamein this famous fighter proved itself a gallant son of the equally famed Hawker Fury

WORLD WAR II TRIO

Hawker Hurricane

■ Few, if any, of the world's fighting planes can rival the record of the famous Hawker Hurricane. Designed by Sidney Camm in 1934, the Hurricane was a low-wing monoplane outgrowth of the famous biplane "Hawker Fury." Twenty-four different versions of the Hurricane were used during World War II and it saw action on seventeen fronts

The early, eight machine gun, 300 mph, two-bladed propeller Hurricanes were with the British Expeditionary Force in France in 1939.

It was during the Battle of Britain that these craft really made history. Working as a team with the handful of Spitfires available, the Hurricanes wreaked real havoc upon the German bombers while the faster Spitfires fought off the protecting Me 109 escorts. During the "Battle" four 20-mm cannon or twelve machine guns were fitted.

In order to combat Rommel's armor in Africa, the Hurricane was fitted with two 40-mm cannon in 1942 at El Alamein. This version utilized a special air intake housing filter because of the desert heat and sand (see plans).

A twelve-cylinder, Vee type 1250 hp liquid-cooled Rolls-Royce Merlin engine swinging a three-bladed wooden propeller pulled this fighter to a maximum speed of 335 mph. With a ceiling of about 31,000 feet its performance was inferior to the Spitfire, Mustang or Folke-Wulf 190. Yet, the Hurricane could take care of itself against almost any adversary because of its ruggedness and firepower. Two auxiliary wing tanks boosted its range to 1500 miles.

Our model is built to the scale of ¾" equals one foot and will accommodate engines from .14 to .35 cubic inch displacement. Plans illustrate the desert-version nose as well as 40-mm gun installation for the benefit of those who care to build this interesting modification. The early eight-gun version is also illustrated. When powered by a .29 engine the complete weight of our model was 24 ounces. Projected wing area is 128 square inches, which makes the ship eligible for team racing when using the desert fighter nose. This will enclose most engines up to .29 cubic inch displacement to meet the racing rules.

Construction is very simple throughout, utilizing sheet balsa fuselage sides and sheet-covered wings without leading or trailing edges. Start by cutting the ¼" balsa sheet fuselage sides. Medium soft wood can be used but both sides must be cut from the same hardness of wood in order that they both will bend in identical fashion. Be certain to cut out the space to accommodate the wing center section and also for the engine (*Continued on page* 67)

Hawker model taking off

Grumman F4F-4 Wildcat

■ One of the first monoplane fighters of the United States Navy, the Grumman Wildcat was the standard naval fighting airplane force through 1942, exacting a heavy toll of Japanese planes until its replacement by the Hellcat and Corsair fighters.

The weight of 6,100 lbs. and span of 38 feet gave the Wildcat a comparatively light wing loading and, therefore, maneuverability to meet the Zero on more equalized terms than the ill-fated P-40. Powered by the R-1830 Pratt & Whitney Twin Wasp of 1,200 horsepower, the cruising range was 1,120 miles. Top speed was in the neighborhood of 325 miles per hour. Ceiling, 31,000 ft.

Four .50 caliber machine guns were located in the rigid wings of the F4F-3; six guns were installed in the manually operated folding wings of the F4F-4. A number of stripped Wildcats (F4F-7) saw reconnaissance duty. Countless F4F fighters were delivered to the Royal Air Force and were designated "Martlet." Used by the Navy and Marine Corps, the F4F was operated from land bases as well as airplane carriers. The Wildcat was one of the first United States planes to employ self-sealing fuel tanks and protective armor plate for the pilot.

Most engines from .14 to .29 cubic inch can power this ¾" equal 1' 0" scale replica of the F4F-4. For some extra speed a .49 engine can fit in the extra large nose. This is for the expert speed demons only! Utilizing a vertical keel and formers, you can fashion the fuselage planking with considerable ease. Shall we begin?

Cut the sheet balsa wing covering to shape and butt-join two 3" widths to form the correct chord distance. Taper the spar as the plans specify and ce-

This one will keep you busy for awhile—but she's a fine ship to add to your collection; markings are for early Marine fighting squadrons in the Pacific

ment these to the bottom covering. The wing is made in two panels. Cut the spar joiner from plywood and cement it to the balsa spars. This automatically forms the correct dihedral angle. Add the wing ribs at this time. It is important that a slot be cut into the spars as the plans illustrate. This is necessary in order to allow space for the bellcrank which is mounted in the wing. Drill a hole in the hardwood bellcrank mounts. Two mounts are used, cemented to the spar. Use plenty of cement.

Attach the wire lead-out lines to the bellcrank by twisting and soldering the ends. Pass these lines through the holes in the ribs and slip the bellcrank between the bellcrank mounts and hold in place with a bolt. Smear cement over the nut to prevent it from loosening. We fly in a counter-clockwise direction and therefore locate the bellcrank and lead-outs in the left wing (port side). Install the wire control rod by either using an offset bend or by soldering a washer to the control rod end to prevent it from slipping off the bellcrank.

Bevel the leading and trailing edges of the lower covering to fair into the upper wing rib curvature. The top of the wing is now covered. With the sheet covering butt joined and cut to outline shape, it is cemented to the spar and held in place with pins. Now, apply cement to the rear portion of the ribs and the beveled lower covering. Pin the upper covering to the ribs until the cement is dry. Repeat for the forward portion of the ribs. Add the solid balsa wingtips at this time. It will be necessary to drill holes in the port side wingtip to admit the lead-out wires. When the wing is completely dry it should be thoroughly sanded smooth with 1/0 and 3/0.

Cut the sheet balsa vertical keel, cut out for the wing; cut the large space in the nose for the engine and combine the lower portion of the vertical fin as part of the keel. The stabilizer will rest upon the keel and the fin placed atop the stabilizer. Slide the wing through the slot and cement well. This is followed by the addition of the formers to the keel. When this is complete the landing gear platform and former "H" should be firmly cemented in place. The fuselage keel is cut to receive the plywood platform which is made in one piece.

The type and make of engine should be determined before construction progresses further because this governs the height and distance between the engine mounts. We bolted the engine to standard commercial K&B metal mounts which can be used for any engine. These mounts should now be bolted to the plywood firewall. They are of steel and therefore the nuts should be soldered in place onto the mount. However, if aluminum mounts are used the nuts can be soldered to a piece of thin brass or tin can metal and held in place on the engine mount by means of a self-taping sheet metal screw (¼").

Bend the three landing gear struts to shape and force through the keel. Bind the joint with fine soft wire and solder well. With this complete the landing gear struts are firmly attached to the plywood by several coats of cement.

The elevator halves and stabilizer are cut to shape and sanded to a streamline cross-section. Cement the elevator halves to the dowel spar and, when dry, install a commercial metal bellcrank. Hinge the elevator assembly to the stabilizer, using cloth patches for hinges. Note that one half of this cloth is cemented to the top of the stabilizer and the other half to the bottom of the elevator, and this is alternated top and bottom with the remaining strips. Securely cement the stabilizer atop the keel and (*Continued on page* 61)

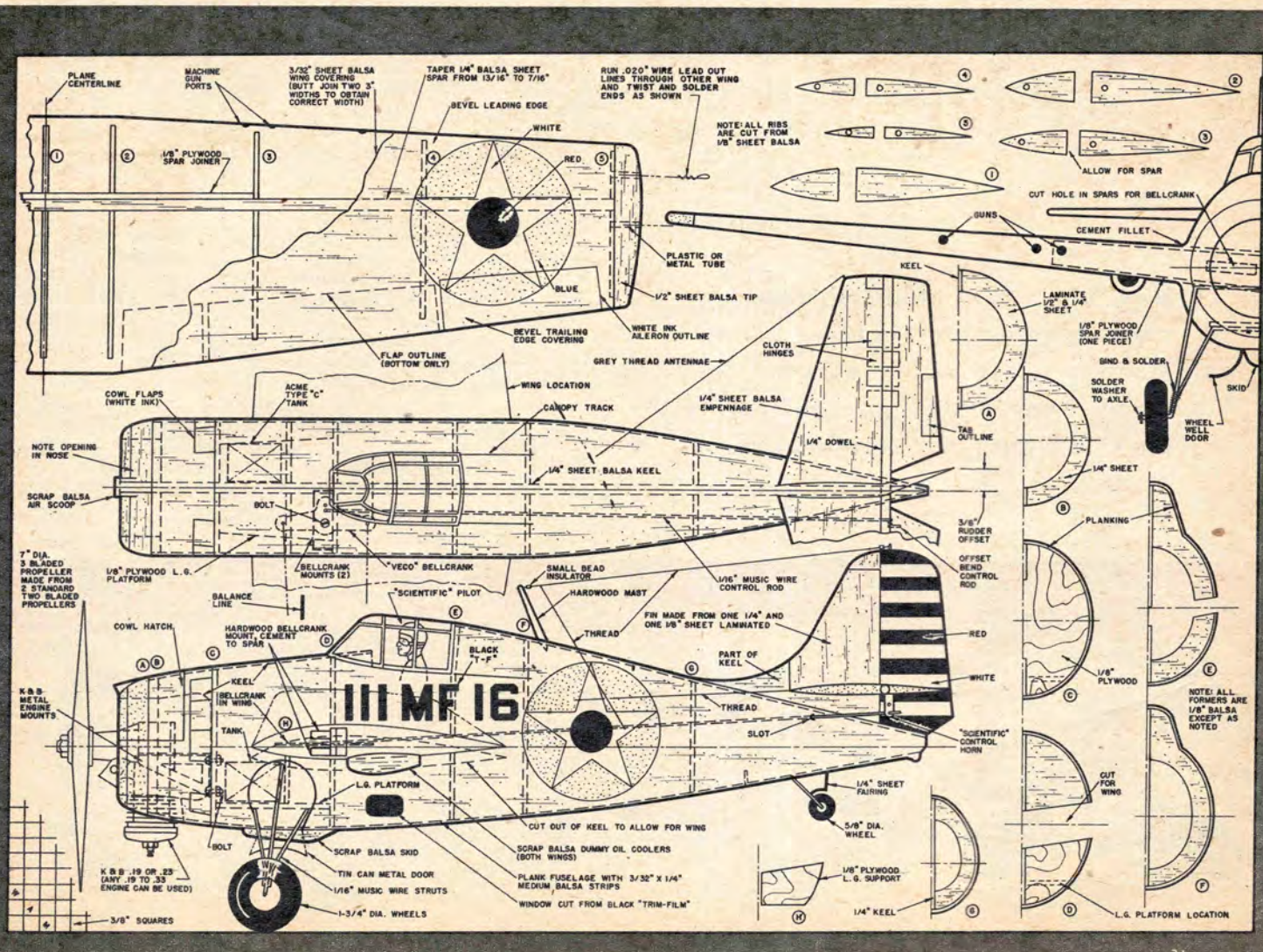


Fig. A

Fig. B

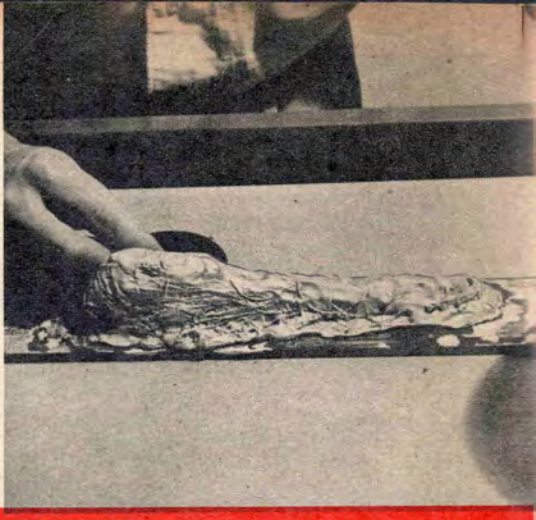


Fig. C

Plastic Laminated Models

By LLOYD V. HUNT

Next big step in modeling: low pressure laminates for lighter, stronger models. Good for speed shells; the resins alone offer many possibilities for free flight fans. Next month: R/C

■ The use of laminates in full-size aircraft components is not new. Many aircraft manufacturers use this product in wingtips, radomes and ducting.

More recently attention has been devoted to glass fabrics as a suitable laminate for use in aircraft structures, along with various new molding techniques. The Royal Aircraft Establishment in England, for example, displayed a "plastic" delta wing. The wing was designed for flight testing on small high-speed aircraft.

Basically the techniques that have been developed for molding glass cloth fall into two categories, each of which can be associated with one of two distinct types of bonding agents: thermosetting and cold setting. The resins in the thermosetting group require the application of heat and pressure to complete the hardening process. The cold-setting resins harden at room temperature without the application of pressure. The low-pressure laminates, which will be described in this article, are usually called "contact" laminates, which are fabricated at pressures from 0 to 10 psi.

The setting process is controlled by the addition of an accelerator. Variation of the setting time may be controlled over a period of a few minutes to hours. This of course is determined by the size and shape of the laminate to be made.

One type that may be used are called Polyester Resins and are commercially available from any one of the many suppliers such as Marco Chemicals Corp., who make MR 28 C; Pittsburgh Plate Glass Co., Selectron; General Electric Co., G-E; Plaskon Division, Libbey Owens Ford Co., Plaskon.

Several types of each of the resins are available, and it is recommended that the manufacturers be contacted for selection of the best resin suited for room temperature setting laminating process. Also the resin manufacturer may recommend a catalyst other than the particular type outlined in this article.

Glass fabrics are manufactured in a variety of weaves that range from 0.002 to 0.060 inches in thickness. The fabric

Fig. G

Fig. H

Fig. I

Fig. D

Fig. E

Fig. F

processes high heat resistance, low water absorption and high strength characteristics. Considering these factors plus the fact that resins and glass fabrics are easily obtainable, they offer to us model builders a new product to consider in pursuing our hobby.

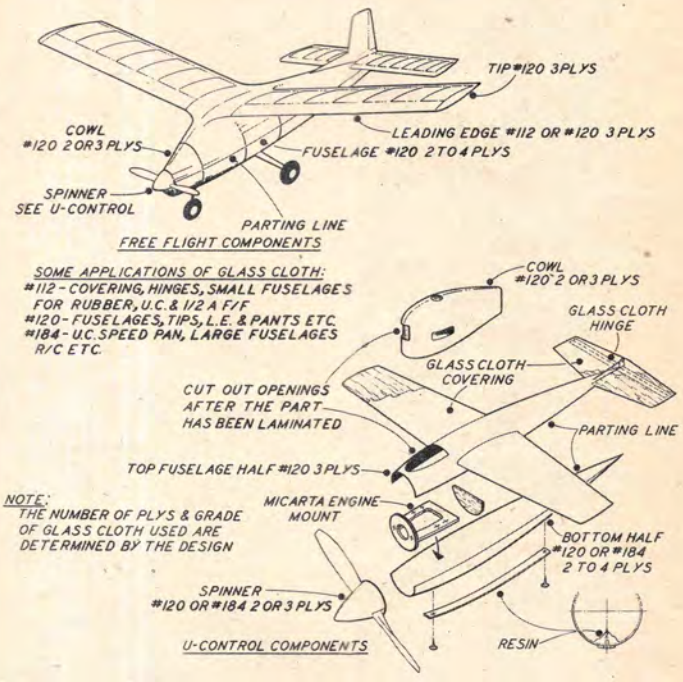
The weavers of glass fabrics are Owens Corning Fiberglas (Toledo 1, Ohio) and Trevarno Glass Fabrics (a West Coast manufacturing and supply concern, Livermore, Calif.). There is also a kit available consisting of all items needed to laminate components. Information regarding this may be had from Plastic-Arts, 3336 India St., San Diego 1, Calif.

Some grades of the glass fabrics best suited for model work that we have used are: type #112, thickness, .003; #120, .004; #184, .027.

The types listed will produce rugged light shells suited for almost any component wanted, but with the wide variety of glass fabrics available, you might wish to use some other grade. The weight of the part is governed by the resins and the amount of laminates used. For the average laminated layups refer to the design data sheet.

Patterns: Design consideration should first be employed in the layout of any part. The most important point to consider is the parting line of the patterns. Examples of different approaches to this are illustrated. As a rule, the pattern must be designed so that all parting lines will be substantially formed by wood sections ending in corners not materially less than 90 deg. angularity. The patterns may be carved from any type soft or hard wood. Care should be taken in the finishing of the patterns as the plaster molds will reproduce every detail that is present. Sanding sealer or any other type of finishing process is advisable to insure a smooth well sealed part.

Plaster Molds: A fast simple method for making the molds is illustrated in Figs. B and C. Plaster of Paris or casting plaster should be used. Before attempting the plaster mold layup, be sure that the patterns are well greased with vaseline or stearic acid to release the (*Continued on page* 68)


TIP #120 3 PLYS
LEADING EDGE #112 OR #120 3 PLYS
FUSELAGE #120 2 TO 4 PLYS
COWL #120 2 OR 3 PLYS
SPINNER SEE U-CONTROL
PARTING LINE
FREE FLIGHT COMPONENTS
SOME APPLICATIONS OF GLASS CLOTH:
#112 - COVERING, HINGES, SMALL FUSELAGES FOR RUBBER, U.C. & 1/2 A F/F
#120 - FUSELAGES, TIPS, L.E. & PANTS ETC.
#184 - U.C. SPEED PAN, LARGE FUSELAGES R/C ETC.
COWL #120 2 OR 3 PLYS
GLASS CLOTH HINGE
GLASS CLOTH COVERING
CUT OUT OPENINGS AFTER THE PART HAS BEEN LAMINATED
PARTING LINE
TOP FUSELAGE HALF #120 3 PLYS
NOTE: THE NUMBER OF PLYS & GRADE OF GLASS CLOTH USED ARE DETERMINED BY THE DESIGN
MICARTA ENGINE MOUNT
BOTTOM HALF #120 OR #184 2 TO 4 PLYS
SPINNER #120 OR #184 2 OR 3 PLYS
U-CONTROL COMPONENTS
RESIN

DESIGN DATA

MAJOR MATERIALS NEEDED
PATTERN
PLASTER OF PARIS OR CASTING PLASTER
EXCELSIOR OR BURLAP
WAX (CARNAUBA)
PARTING AGENT
RESINS (MARCO MR-28C ETC)
GLASS CLOTH

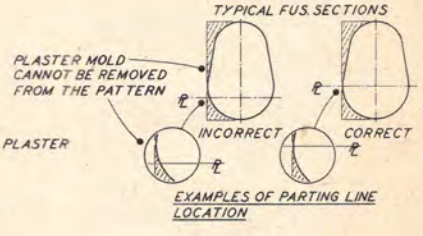


Fig. J

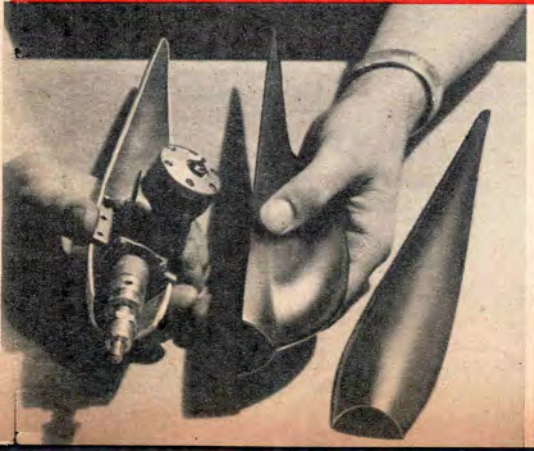


Fig. K

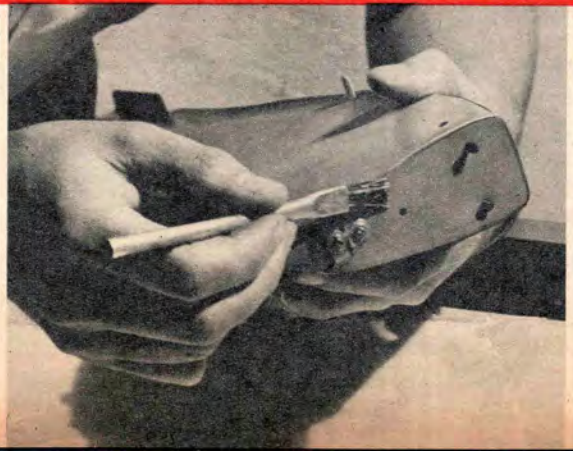


Fig. L

DEVIL

A JET CHAMPION'S GREATEST MODEL

0 1 2 3 4 5 6 7 8 9 IN.

1/32" PLYWOOD TANK SIDES

TANK INTERIOR GIVEN 4 COATS OF DOPE TO SEAL PORES

CUT-DOWN "PERFECT" BELLCRANK

ASBESTOS ACTUALLY COVERS MOST OF BELLCRANK RECESS

END OF SPRING PROTRUDES FOR SPARK CONTACT

WHITE MAPLE SPAR

1/32" ASBESTOS

HARD BALSA OR BASSWOOD FUSELAGE

HARDWOOD INSERTS IN BOTTOM

SECTION

3/32" ALUM. TUBE

ELEVATOR IN LEFT SIDE ONLY

STITCHED FABRIC HINGE

HARD 1/4" SHEET BALSA WING

SECTION

NOTE STABILIZER DIHEDRAL ANGLE

SAW WING SPAR FROM 1/2" WHITE MAPLE

CORNERS ROUNDED

DIHEDRAL

7/64" DIA. HOLES

FRONT YOKE PLATE

DRILL AND COUNTERSINK FOR 1" WOOD SCREWS

BEND

1/16" ALUM.

BEND

.020 STAINLESS STEEL

BEND

ALUMINUM FIXING BLOCK

DRILL, TAP 4-40

DRILL, TAP 6-32

4-40 MACHINE SCREWS

3/32" ALUMINUM TUBES

FLEXIBLE CABLE

BOUND AND SOLDERED

ASSEMBLY

1

SAW FUSELAGE TO SHAPE; CEMENT PLY. TANK SIDES; MOUNT YOKE PLATE, HARDWOOD INSERTS; DOPE TANK INTERIOR; SHAPE AND SAND FUSELAGE

2

ADAPT SPINNER, FIT REAR MTG. STRAP TO DYNAJET; FIT TUBES IN TANK TOP, CEMENT IN PLACE; MOUNT WING SPAR AND BELLCRANK, RECESS FOR PLUG

3

SHAPE AND JOIN WING PANELS, STABILIZER; CONNECT PUSHROD, LEADOUTS; DOPE ON TISSUE; ADD SKIDS; FINISH AND POLISH MODEL; ADD ASBESTOS

FIT A 2 1/4" DIA. FROOM SPINNER (CUT OFF FRONT) OVER JET HEAD

CUT OFF DYNAJET HEAD FINS

1/8" I. D. VENT

DRILL AND TAP TWO 4-40 HOLES, 3/16" DEEP, FOR YOKE PLATE

FUEL "DYNAJET" WITH WHITE GAS; USE Nº 4 METERING JET

STAINLESS STEEL REAR MOUNTING STRAP

WING, STAB, ENGINE AT 0º INCIDENCE

1/16" STEEL WIRE PUSH ROD

SQUARE EDGE

ROUNDED

SPARK PLUG RECESS

1/8" I. D. BRASS TUBE HEAT TO SOFTEN AND BEND AS SHOWN

1" WOOD SCREWS

SPRING CONTACT .032 STEEL WIRE

HARDWOOD INSERT

6-32 BOLT

1/16" STEEL WIRE SKID

1/32" SHEET ASBESTOS INSULATION — USE "WELDWOOD" GLUE

6-32 BOLT

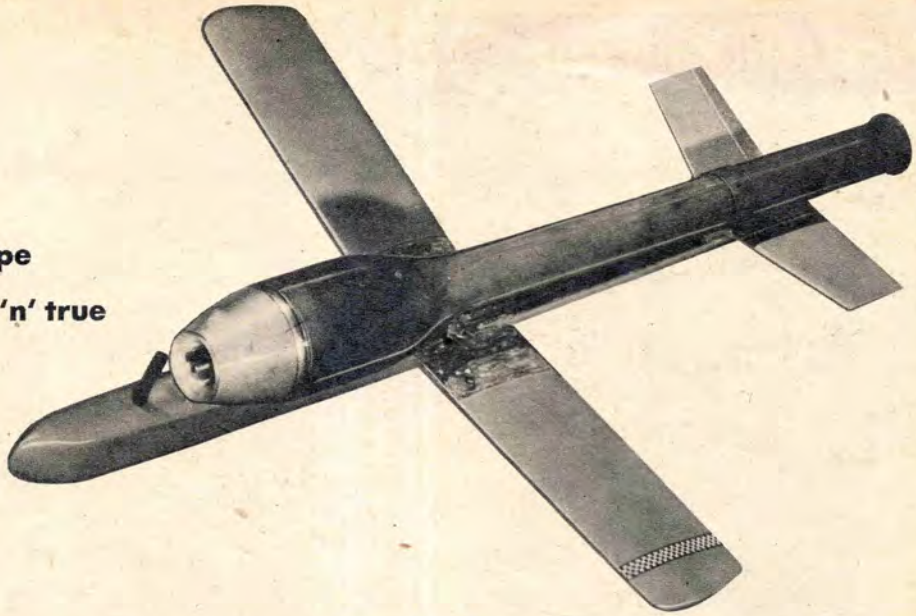
HARDWOOD INSERT

1/16" STEEL WIRE SKID

NO TAKEOFF DOLLY USED

DART

He won jet contests in Europe and America with this tried 'n' true Curtiss Dyna-Jet model



By THOMAS P. BAKER, USAF

North Carolina's Tommy Baker found the Air Force a good place to continue modeling. In '51 was high-pointer at AF's World Wide Model Airplane Championships. Now conducts USAF hobby programs in Florida, is member of Palm Beach Cloud Busters. Wife Beth and earlier D.D. are shown here above.

■ *Devil Dart* is by no means a newcomer to the jet circles throughout the South, having seen Nationals competition in 1950, 1951 and 1952 and having placed two firsts and a second. In 1951 and 1952 the model took first in jet in the Air Force World Wide Championships. Under present AMA rules, *Devil Dart* is the only jet to hold the open speed record, having established its first record at High Point, N. C., at a speed of 142.80 mph. The second record was established at Charlotte, N. C., at a speed of 147.49 mph. The present record was established at Springfield, Mass.—154.95 mph. Variations in speed are due to a difference in atmospheric pressure, temperature and humidity.

Devil Dart is a good-handling, rugged, reliable contest ship. The record speaks for itself.

Before beginning construction, the fins on the head of the jet should be turned down. Your local machine shop can do this for only a small cost. The head is cowled in with a 2¼" spinner. Care must be taken in drilling and tapping head for front yoke plate. Each hole must be centered between intake holes and should not go all of the way through the back of the head as leaks here may be hard to keep sealed. Next, make rear hold-down strap and fix-block as indicated on plans. Make front hold-down yoke from 1/16" sheet aluminum. Now you are ready to begin construction.

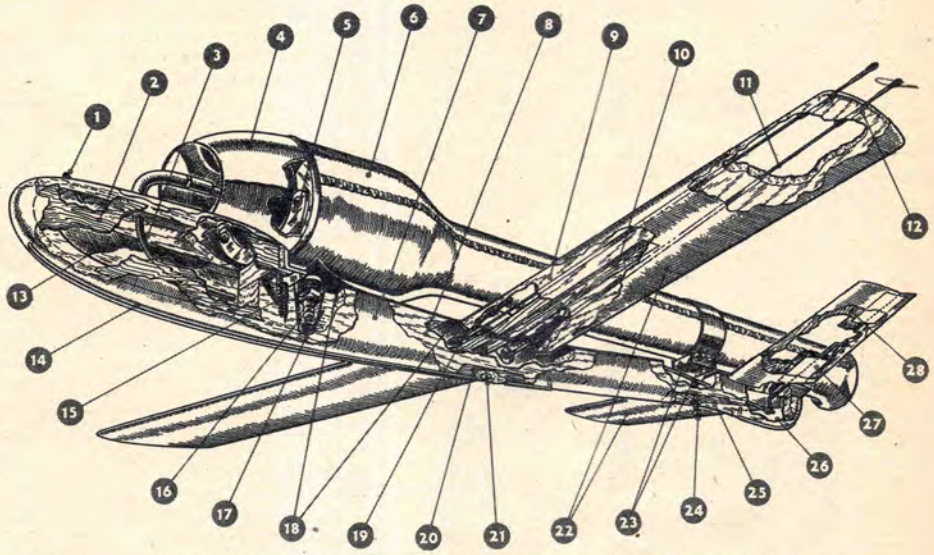
Carve top and side views of fuselage from a 1"x1¾"x23" piece of basswood or hard balsa. Saw out section for gas tank. Cut tank sides from 1/32" sheet plywood and glue onto fuselage, leaving the top of the tank open. Give inside of the tank about four coats of clear dope to seal pores in the wood. Heat a piece of ⅛" brass tubing red hot and allow to cool. Shape fuel line as shown on plans. Install gas line and vent tube and glue top on tank. When dry shape fuselage as shown on plans. Mount front hold down yoke to fuselage with three 1" wood screws. Gouge out spark plug recess. Make hardwood insert to go under rear hold-down bracket, and drill hole for rear hold-down bolt.

Saw out wing spar as indicated from a piece of ½" sheet maple. Notch fuselage for wing spar. Modify a small Perfect bellcrank as indicated and mount spar and bellcrank to fuselage. Carve wing panels from ¼" sheet medium hard balsa. Cut out for spar, and mount panels on spar and fuselage. The wing is set at 0 degrees incidence, using the jet tube mounted temporarily to fuselage as a guide. The stabilizer is made from a piece of ⅛" plywood. Install controls as shown and mount stabilizer at 0 degrees incidence.

Cover top of fuselage and portion of wing and bellcrank nearest to the jet engine with 1/32" sheet gasket asbestos. Use Weldwood glue to bond asbestos to model. Install 1/16" spring steel wire skids.

Sand entire model smooth with 400A sandpaper and brush on two thin coats of clear dope. Cover entire model with lightweight Silkspan. Brush on two more coats of clear dope, sanding lightly after each coat. Give model two or three coats of sanding sealer and sand with 360 wet-dry sandpaper after each coat. Brush or spray model with two or three coats of your favorite colored dope. Rub down last coat and wax.

Before mounting jet, make spring contact for spark plug from a coiled piece of .032" spring steel wire. Drill 1/16" hole through fuselage so that it ends at bottom of spark plug recess. Feed long end of spring through hole and pull spring to bottom of recess. Cut off wire leaving about ¼" long for starter contact. Mount jet engine and you are ready for a test hop. Use a #4 metering jet and white gasoline. The model is skidded off the ground instead of via a dolly. We find that method easiest, most fool proof.



1. Tank vent. 2. Plywood tank sides. 3. Fuel pick-up. 4. Head fairing adapted from Froom spinner. 5. Yoke plate. 6. Dyna-Jet Red Head engine. 7. Silkspan and colored dope. 8. Hard balsa or basswood. 9. Balsa sheet. 10. Wing spar. 11. Lead-out lines. 12. Aluminum tube line guides. 13. Tank. 14. Wire skid. 15. Screws to secure yoke plate. 16. Spark plug recess. 17. Spring contact wire. 18. Asbestos insulation. 19. Bellcrank. 20. Hardwood insert. 21. Front hold-down bolt. 22. Silkspan and colored dope. 23. Strap and fixing block. 24. Rear hold-down bolt. 25. Hardwood insert. 26. 1/16" steel wire horn and pushrod. 27. Hinge. 28. Stabilizer.

Western Roundup

Beware of cut-outs on metal spars for speed models—DE

When Lt. Robert Randolph was at Keesler he sent along pix of son Bobby reading our mag. Discarded .23 with piston removed is favorite toy. Trophies belong to the Lt., a rabid F/F'er.

■ Contests all over the West . . . we took in five last month . . . drove over 2000 miles. For the first time in the more than five years we have been out here, the weather reared its ugly head and made some contests rough. Wind and rain postponed one contest; wind made Lyman Armstrong lower the flight limit to 3 minutes!

The first was the Pacific States U-Control Championships. The weather for this one was swell, the stunt tables and flying scale tables were manned with free flighters. Bob Moncrieff served as C/D.

In stunt we noticed quite a few having trouble with the new stunt rules. Bob Palmer and Dennis Alford were just two who found it a little rougher to fly extra laps, both suffering from engine trouble. Dennis finished way down in fifth place, while Bob was nosed out by Charles Brussell. We saw some beautiful ships—Ralph Yount's red Stuka, Palmer's super "Smoothie," Marv Becker's twin Torp .19 stunter. Real purty.

In scale the contest was dominated by Frank Estrada and Jim Devitt with Frank's Navion and Jim's P-70. Jim, though, is building a new ship and Frank has promised that next year he will too.

In speed some events took place which didn't do the game any good. We had to take some close looks along with Lew Mahieu at two speed jobs which broke loose. Examination showed the same reason caused both accidents: the wing spars broke at the bellcrank. One ship had just turned in 148 plus when this happened! Direct cause of these mishaps was the cut-out metal spars. Should metal spars be outlawed? Should we insist that all bellcranks be permanently attached to the fuselage? Just exactly what should be done?

After entering and flying in a speed contest we are wondering if the reason for so few U-control contestants is the time they must wait for a flight. We waited 2 hours and 45 minutes for our first flight. Some fellows never did get in their flights.

This contest brought out some of the guys who hadn't been seen since the Nats —Dick Rigney and Bill Wiscznewski. George Cassellberry and Dan Lutz had the purtiest ships we had ever beheld. George even built a carrying case for his model. One couldn't help but admire the superb flying and get up and go of both Walter and Bill Spawr. These junior contestants build all their models, helped over the rough spots by their father; they managed to win 1st and 2nd places in Half-A and A junior.

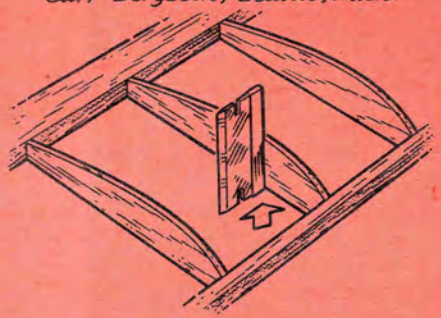
We enjoyed a very sound bull session with Don Donahue while waiting to fly. Don is trying to establish some rules to interest beginners in rubber-powered models. He feels that most of the model builders of today sure miss a lot when they don't build rubber. Don says that the ballot for voting on rules either gave you one thing or nothing. His idea is a class of under 100 sq. in. with no weight rules or any other rules. Let the guys build anything they want. Thinks this will give the kids a chance.

The second contest was the San Diego PAA meet, bigger and better than ever, one which saw (*Continued on page* 62)

Thirty-two inch control line, four Jetex engine powered B-52 by Frederick E. Pierce, Cheney, Wash. Planked covering of 1/32 and 1/16" sheet. Sweep is 35 degrees. Quite fast.

Dick Atkins, designer of the B-26 control liner in the last "AT" Annual, sends along this pix of Van Der Caay of Haag, one of Europe's most noted model designers—contestants and A/2's.

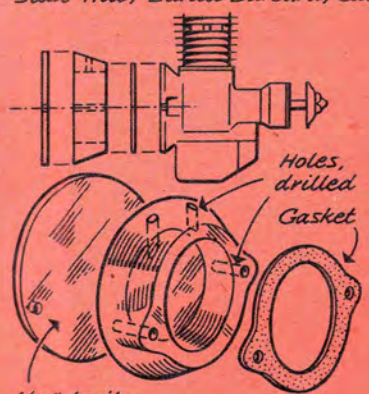
True vertical alignment of ribs is assured using a single-edge razor blade as miniature "square" reports Cliff Bergseth, Seattle, Wash.

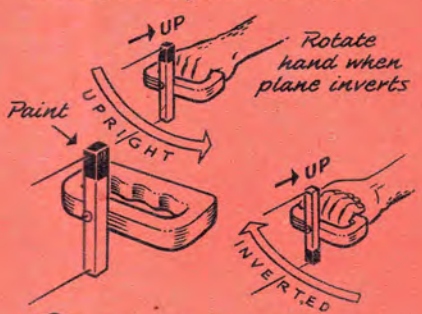


Sketch-book

Have you developed something new in construction, control or flying? Send a rough sketch—we'll re-draw it and pay $5 for each accepted. Contributions should be original ideas; sorry we cannot enter-into correspondence on submissions.

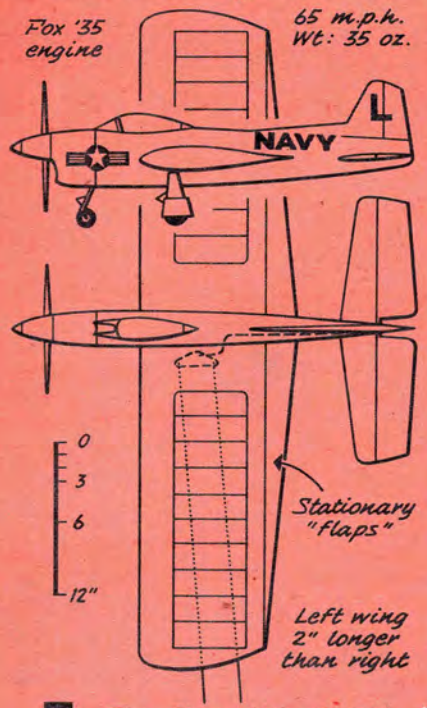
Lucite engine tank-mount has visible contents; material is fuel-proof, can be made for Wasp, Arden, Cub, Torp., etc. says Stan Hill, Santa Barbara, Calif.



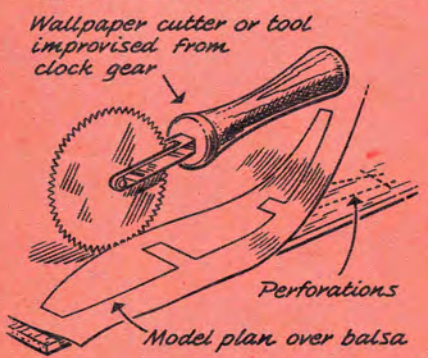


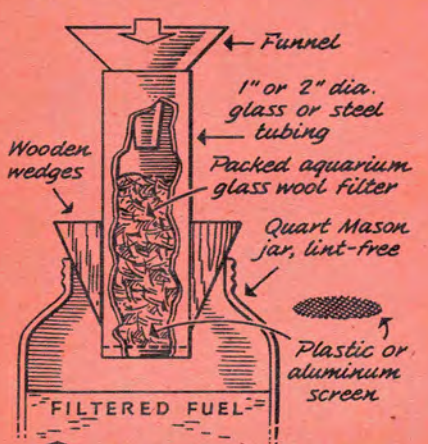
Cure-all for pilots with inverted-flying jitters is novel control handle built by Manuel Castro, El Paso, Texas—

Don Hoag, Newark, Ohio, combines top performance with realism in third version of original "Blooper" stunt design. Cowl from heating duct alum.—



Ray Shaw, Newark, Ohio, speeds construction of models from A. T. plans by transferring printed parts directly to balsa without carbon, pencils, etc.—





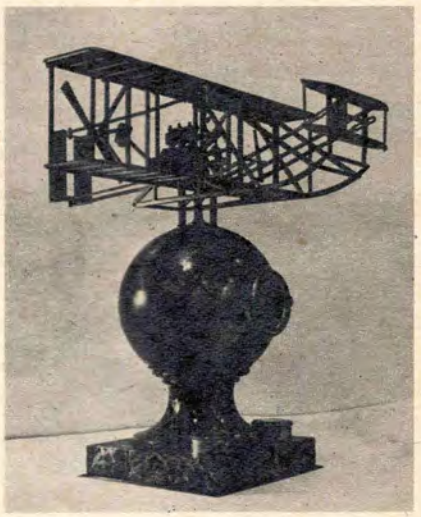
Erratic running and poor engine performance is often caused by sediment & foreign matter in fuel. Filter by William Jones, W. Norwood, N. J., assures clean fuel, can be used repeatedly, costs little—

Challenge Meet Does Fund Raising Job for March of Dimes

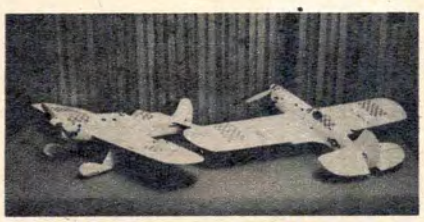
■ In Albany, Ga., the weather was out of this world! Many six-minute flights were recorded. Doubtless a number of perfect 18-minute flights would have occurred had the flyers retrieved their planes in time after they soared away! Conditions were so good that most flyers used long fuses to be sure of the six minutes, and many dethermalized only after eight or ten minutes. The new six-minute limit caught a number unprepared. Dave Dennis journeyed from Valdosta to be the contest director. Don Kimsey, city editor of the Albany *Herald*, was high-point man in free flight, but a few points under Bob Elliott and Tommy Davis from Atlanta who tied for the City of Albany high-point trophy.

Don used to put on the best meets in the South—some 18 years ago! Events then included banner throwing, balloon busting, sky writing and speed runs. Back in those days the JAYCEES sponsored the meets as "benefits" and made money!

At last—Mississippi is heard from! Ed Breland of Radio station WAML at Laurel, Miss., reports that there *are* some of "us modelers" left in Mississippi. Ed now builds and flies R/C—two Robots and a CQ. His friend, E. L. Holifield, is now testing a Javelin with radio equipment built by Ed. Down in Hattiesburg, Ed Singleterry is active in R/C, and Ed says there's another modeler in Meridan. "Some day we three hope to get together and have a contest," says Ed.



Genuine antique aviation trophy with metal model of Wright A. Spring motors drive clock and plane props for 6 hours. Now in custody of Dallas "PAA-Load" Sherman in Tokyo, Japan.



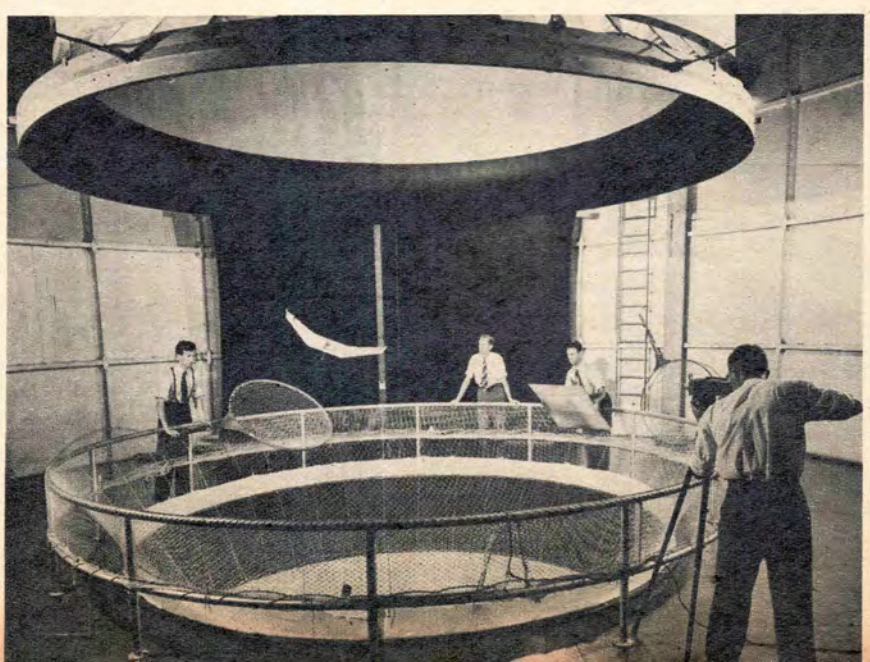
Semi-scale original stunt models by J. L. Osborne, Shelby, N. C. Landing gear has knee-action; has flown with both inverted .19's and .35's. Extended aileron-type flaps. All white.

Jack McCann, of Montgomery, Ala., Rebelaires staged a 3-cornered challenge combat meet as a part of an air show benefit for the March of Dimes. Craig AF Base, Maxwell AF Base, and the Rebelaires competed. Even the flyers paid admission and about $300 was raised. Best of all, this quieted the neighbor's complaints about distracting noises!

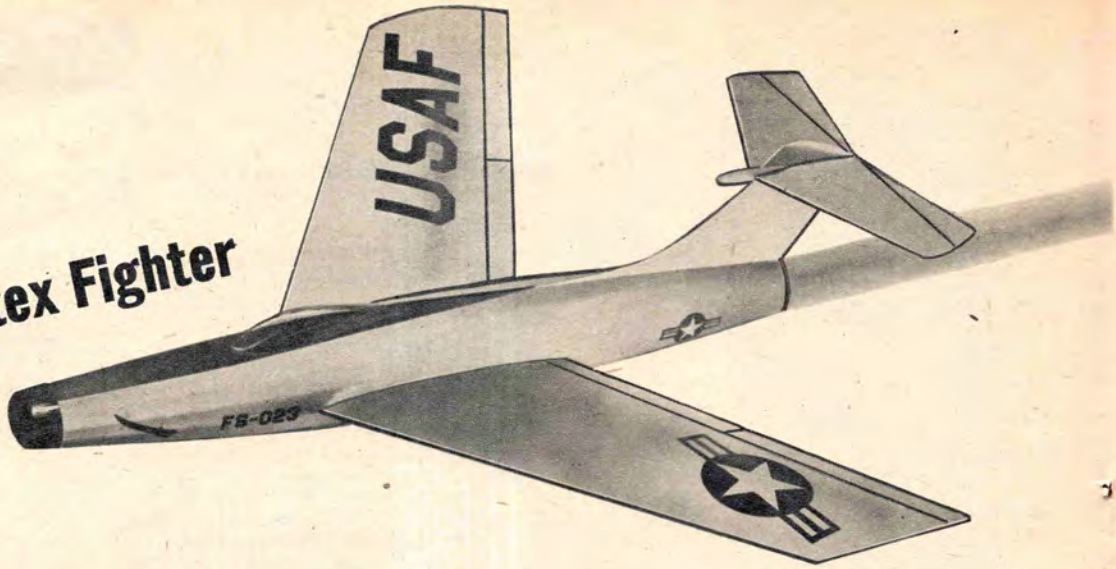
Jerry Stone, age 8, of Jacksonville, Fla., comes up with 93 miles per hour in a recent Half-A speed meet. (Could we have misunderstood you, Ed? This is plenty fast!)

Dave Dennis of (*Continued on page 70*)

No retrieving problems with this type of free flight work! Canadian workers at National Research Council's free flight tunnel (pix from Fairchild Engine and Airplane Corp.).

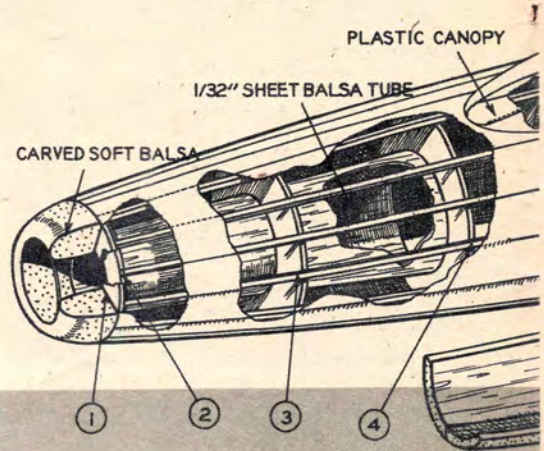


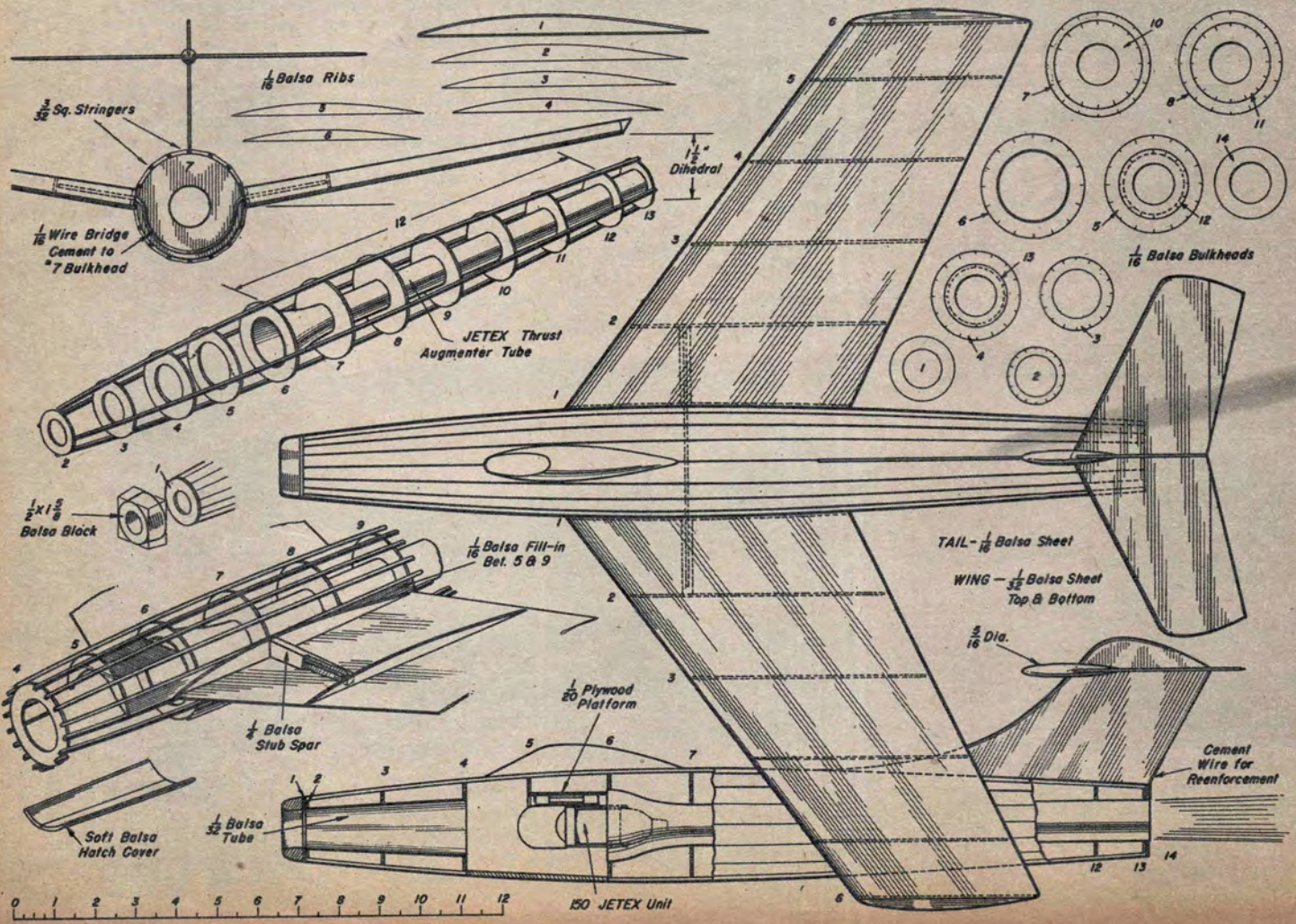
Semi-Scale Jetex Fighter

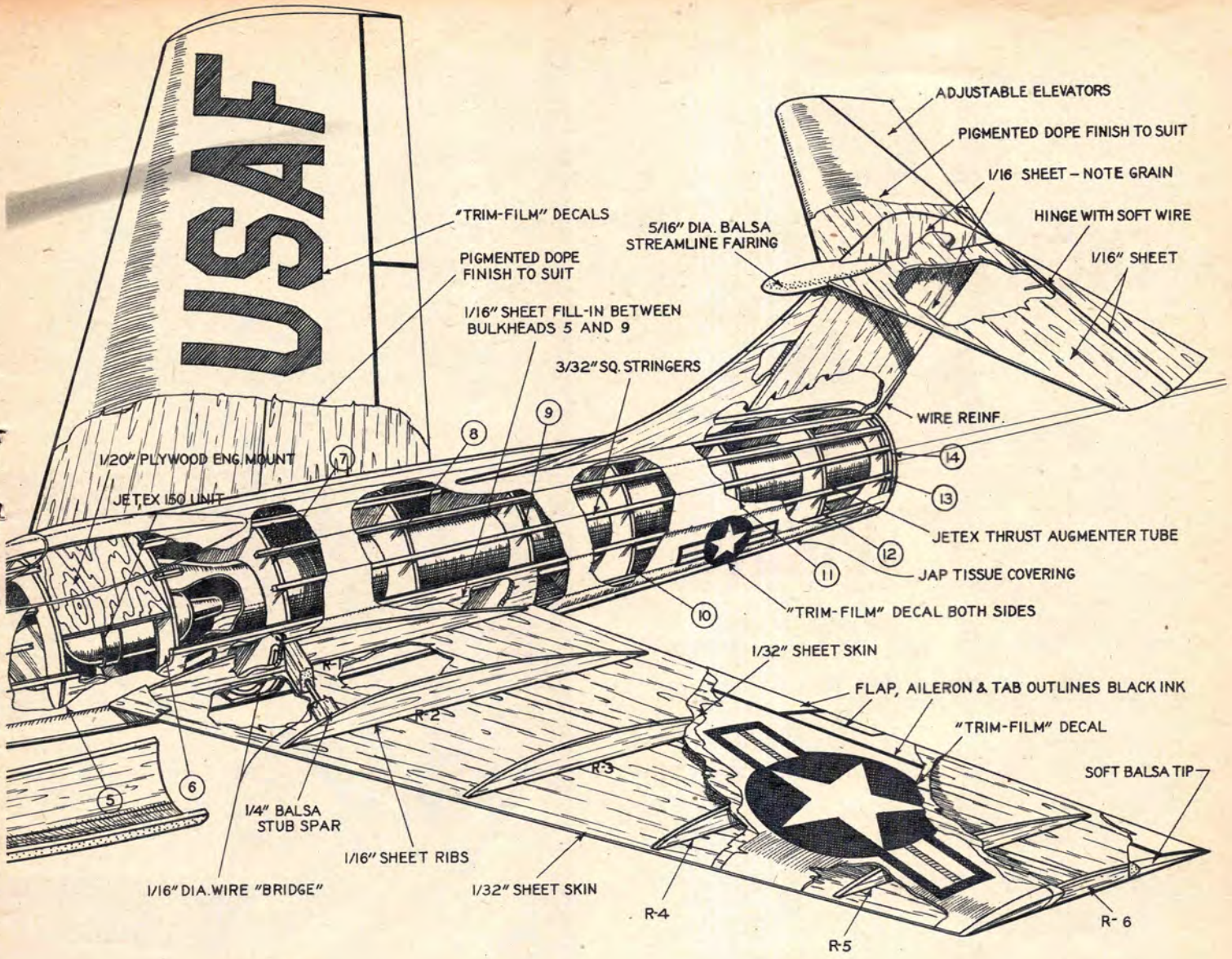


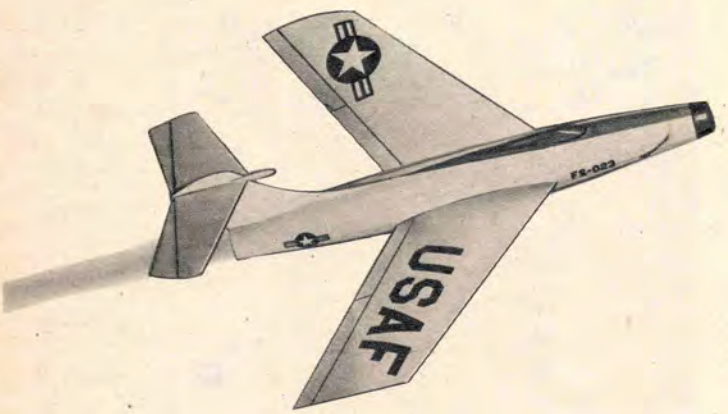
Little Augie

American Telasco's Jetex 150 with its augmenter tube provides the perfect power for realistic jet fighter models




1/16 Balsa Ribs
3/32 Sq. Stringers
1/16 Wire Bridge Cement to #7 Bulkhead
1 1/2" Dihedral
JETEX Thrust Augmenter Tube
1/16 Balsa Bulkheads
1/2 x 1 5/8 Balsa Block
1/16 Balsa Fill-in Bet. 5 & 9
TAIL - 1/16 Balsa Sheet
WING - 1/32 Balsa Sheet Top & Bottom
5/16 Dia.
1/4 Balsa Stub Spar
1/20 Plywood Platform
Cement Wire for Reenforcement
Soft Balsa Hatch Cover
1/32 Balsa Tube
150 JETEX Unit
0 1 2 3 4 5 6 7 8 9 10 11 12





By FRANK EHLING

■ With the Jetex 150 and the augmenter tube, true-to-life jet models are now possible. Any weight that the tube adds is overcome with the extra thrust it gives. And here we can utilize a type of construction where the tube forms the backbone of the fuselage. We use a generous amount of wing area so the model will fly slowly and look quite realistic.

The weight of the original was nine ounces, yet the duration was around 30 seconds; if the weight is lowered even longer flights will result. The weight came in the form of white-pigmented dope which added three ounces, plus the fact that we used heavy wood in the construction.

To start, cut out the required bulkheads, marking them with a pen where the stringers are located. Slip bulkheads #6 through #13 on the tube in their respective places. Next take the four stringers on the top and sides and cement them in place starting at the rear and working to the front. Add the rest of the bulkheads. The remaining stringers are then positioned. Make the nose tube of balsa and cement in place. Add the nose block, carving and sanding it to shape. Cut out the stringers between bulkheads four and six where the hatch will fit. Cut the plywood bulkead and mount the jet holder; be sure that this is located properly—if it is off the jet will have a rifling effect, causing the model to rock in flight. Bend the wire bridge to shape and cement in place. A second coat of cement will be needed here.

Cut out the wing lower sheets. If 6" wide balsa can not be obtained cement two sheets together to make up the size. Cut the required ribs. When cementing the ribs to the lower sheet be sure that they are cemented to produced one right and a left wing panel. Cement in sub-spar. Top sheeting is cemented in place; but be sure to cement it to all the ribs. Trim the wing tips and cement 'em in place; they should be soft balsa. Fill in between the stringers where the wing is located and cement the wing in place. Check to see that all the stringers at the wing junction are cemented well. The rudder is cut out and cemented in place. The wire reinforcement is glued in place with several coats of cement. Cut out the stabilizer and cement (*Continued on page 72*)

ENGLISH A.2 VIKING

A top British builder and flyer reveals the construction of his Nordic towliner

By BILL FARRANCE

■ *Viking* was designed for the A.2 contests and based largely on experience gained at both British meetings and the '52 A.2 World Championships in Austria. My last year's model turned in a regular still-air 3¾ minutes, but this new design is good for a full 4 minutes—from a 328 ft. towline.

It differs from its predecessor in having more of the total surface area concentrated in the wing (440 sq. in.—an increase of 65 sq. in.), which calls for a tail moment arm of four wing chords to make the small 80 sq. in. (18%) stabilizer efficient. This is definitely the type of model needed for the calm air conditions usually aimed for by the A.2 Championship organizers.

Construction is fairly conventional by European standards—with two piece wings dowelled into a detachable center-section. The fuselage is fully sheeted and a piece of curtain rail is used to make a slide for an adjustable tow hook—whilst the wing and stab tips are laminated for strength and lightness. The upper and lower fins originally featured built-up construction (as in photos), but proved vulnerable in landings, so were later replaced by ones made from sheet—as on the plan.

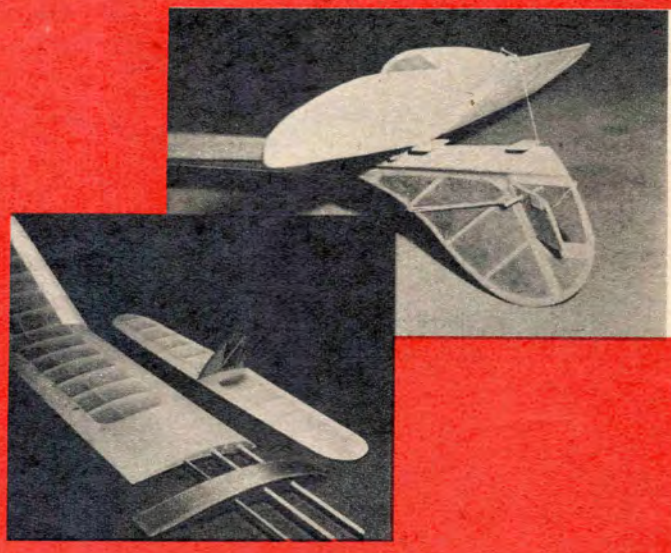
A straight tow-up is ensured by an auto-rudder which remains at neutral as long as the model is on the towline. The tip-up stab D/T is fuse operated in the usual way. The wing section is my favorite *Odenman* (Swedish) type—a thin, sharply undercambered airfoil, typical of those favored by most A.2 enthusiasts.

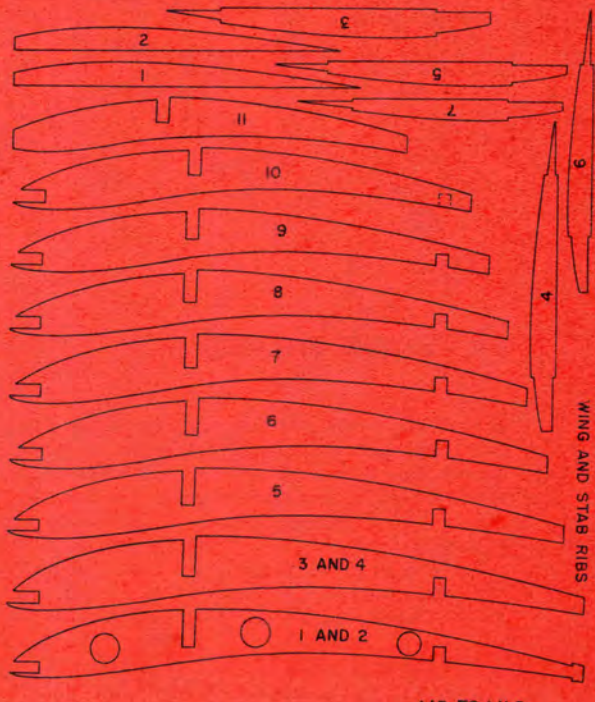
Cover the entire model with lightweight tissue—then after water tightening, give the fuselage three coats of dope and the flying surfaces two coats.

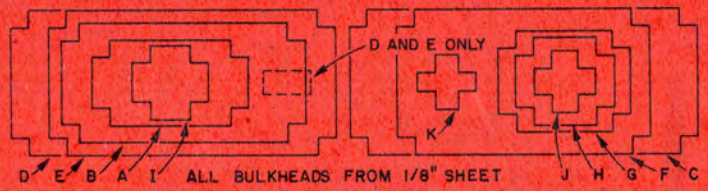
Carry out trimming in reasonably calm weather and do not seal the weight box until all your adjustments have been made. Start by hand launching, until you get a straight stalling glide, then position the towhook ½" in front of the C.G. and try a tow launch. It's best to use a 328-foot line and a short D/T fuse whilst trimming, so that the tip-up stab will operate at a safe height and bring the model down safely. (328 ft. is standard line length allowed for A.2's, but from January 1st, 1954, this will be reduced by half.)

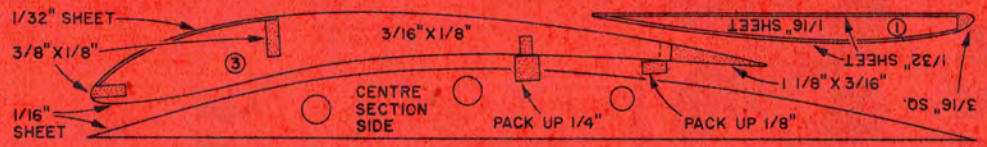
Very little running is needed to get the model going up fast. Correct any tendency to swing from side to side by moving the tow hook back 1/16" at a time until the model straightens up. If you get a swing to one side without any sign of recovery, try counteracting this with opposite trim tab—or if this fails, bring the tow hook forward again. With a little practice, a dead overhead launch can be made. When the model is right above you, wait until the nose is swinging into the trimmed turn (or at least facing into wind) before *gently* casting off. Releasing on the opposite turn should be avoided (*Continued on page* 71)

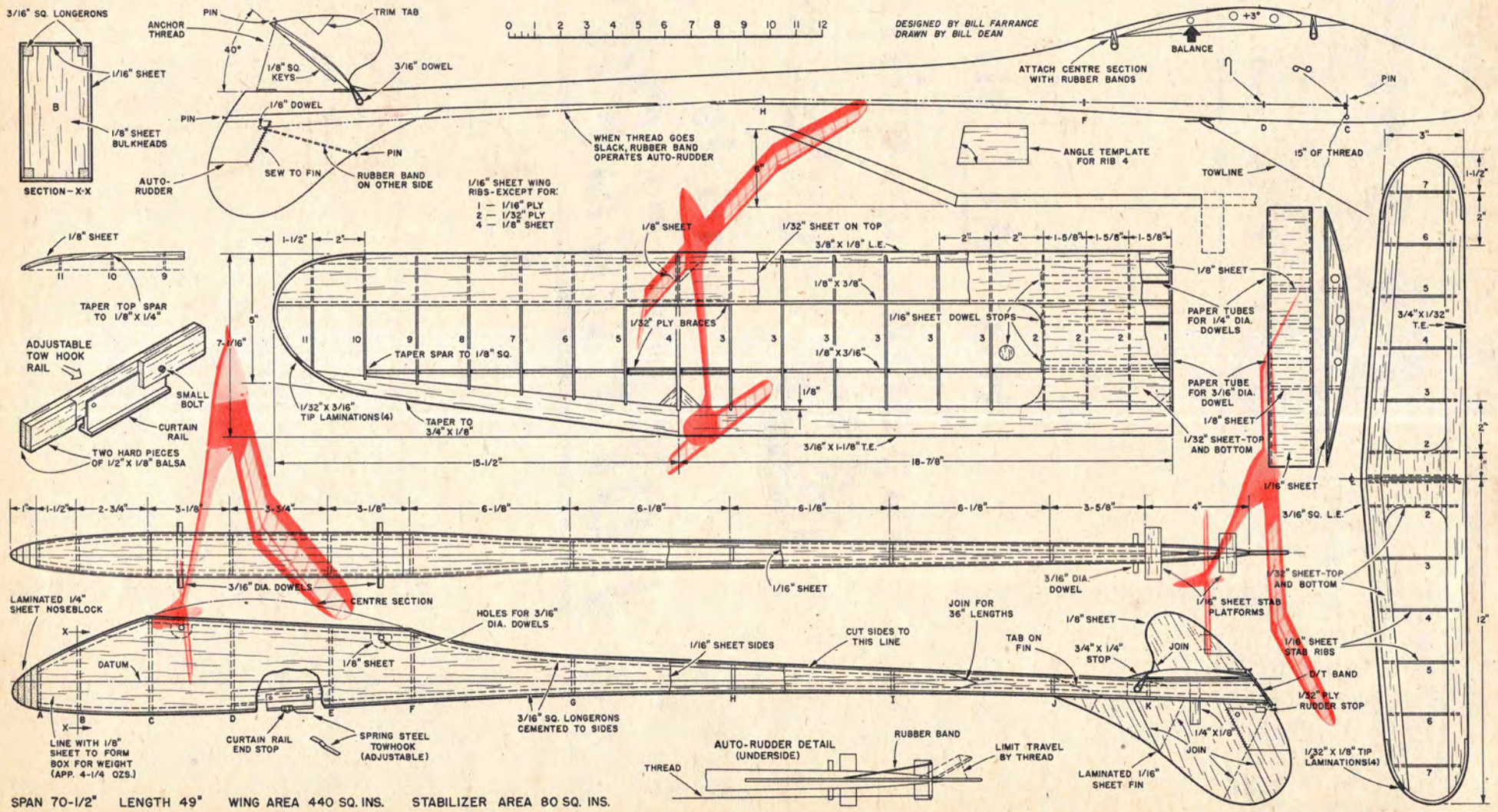
Bill was a member of last year's British "A.2" team, set up English records previous year. Won numerous F/F meets. Member of West Yorks MAC, 28, married, has 2 children. Wing and stab ribs and fuselage cross sections half size.











SPAN 70-1/2" LENGTH 49" WING AREA 440 SQ. INS. STABILIZER AREA 80 SQ. INS.

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- Clear
- Insignia White
- Sanding Sealer
- Thinner*

**35c per quarter-pint*

Look for this self-serving counter display dispenser at your favorite hobby shop...

Skynight from Chicago

Comet's Struct-O-Speed "M" series kit

■ New additions have been made to the popular "M" series of models of Comet Model Hobbycraft Inc. (Chicago Ill.). They are the F3D-1 Skynight, F51 Mustang, and F9F-6 Cougar. All are assembled by the fast and simple Struct-O-Speed method, which assures a realistic finished job, even though the planes are completely built up. Each of the kits retails for $1.00.

Comet's Skynight has a 14¼" span, and is 12⅝" long. The fuselage of this Douglas-designed twin-jet terror is composed of seven formers and numerous planking pieces, all die-cut so that proper fit is assured. Though the planking surfaces are flat, the wood is of sufficient thickness that it may be sanded to the correct smooth round shape. The tricky jet unit intake and exit openings are made very realistic by the inclusion of plastic moldings. Where necessary to assure alignment, the formers and fuselage side strips are slotted and keyed.

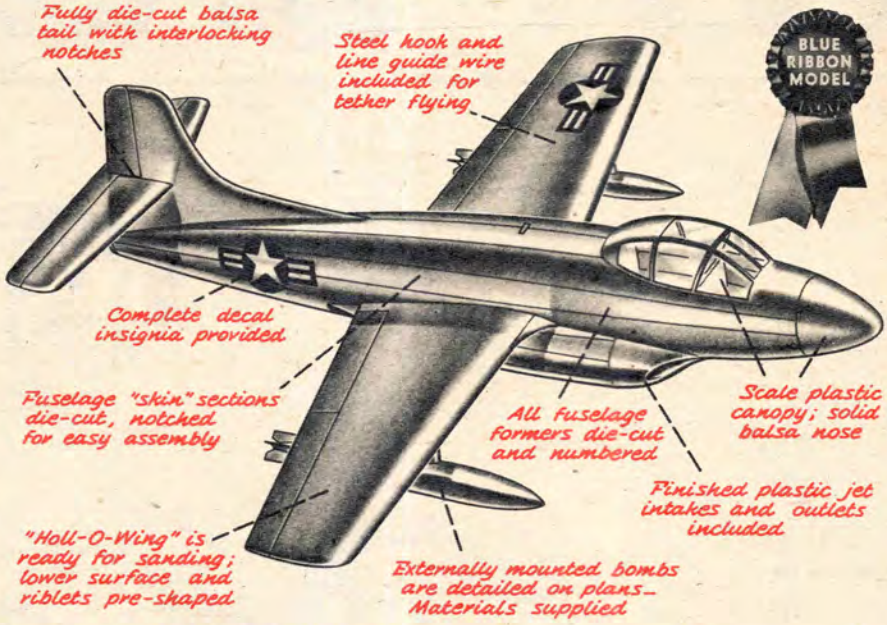
A solid block forms the fuselage nose, and the large and peculiarly shaped cockpit canopy of the Skynight is faithfully duplicated in clear molded sheet plastic.

Tail surfaces are die-cut sheet balsa, and the rudder is in two sections with the grain running in a manner to give the greatest strength.

The wing is built by the Comet Holl-O-Wing method. For those few who don't know, this entails a full-span wing block, which you get cut to shape on top, and trimmed to the correct planform. The underside comes milled out, to save considerable weight. A few ribs and a bottom covering of thin sheet close in this surface. Tips are then added and the wing leading and trailing edges sanded to final shape. Material is included to make two large bombs that hang beneath the wings.

Comet's plan sheet carries an exploded view of the entire plane, plus many assembly drawings of various parts. There is a half-size three-view to show all the markings on the big plane. A sheet of decals insures accurate insignia and lettering.

If the model is to be flown, it is suggested that the nose balancing weight be made from a folded empty cement tube. Wire hooks are attached to the left wing, and the plane flown by whip control with a 5-10 ft. pole and length of fish line.


Fully die-cut balsa tail with interlocking notches
Steel hook and line guide wire included for tether flying
BLUE RIBBON MODEL
Complete decal insignia provided
Fuselage "skin" sections die-cut, notched for easy assembly
All fuselage formers die-cut and numbered
Scale plastic canopy; solid balsa nose
Finished plastic jet intakes and outlets included
"Holl-O-Wing" is ready for sanding; lower surface and riblets pre-shaped
Externally mounted bombs are detailed on plans—Materials supplied

Sil-O-Jet Trio

Berkeley Offers F-94, F9F-5 and F-89 as Jetex Profilers

■ Here is a trio of jet models that you can get into the air in the shortest possible time. Since all the cutting work is done for you, just the assembly remains. Berkeley Models Inc. (West Hempstead, N. Y.) calls these profile jobs "Sil-O-Jets," since the models are of the silhouette style. The kit sells for $1.95, complete with a Jetex 50 motor.

There are three models, F9F Panther, F-89 Scorpion and F-94 Starfire, all span about 13¾" and are about the same in length. The three fuselages are of ⅛" thick balsa and each one has clips for the Jetex engine already fastened to it. To keep tail weight to a minimum, the rudders and stabilizers are 3/64" balsa sheet, and the fuselages are slotted to take these parts.

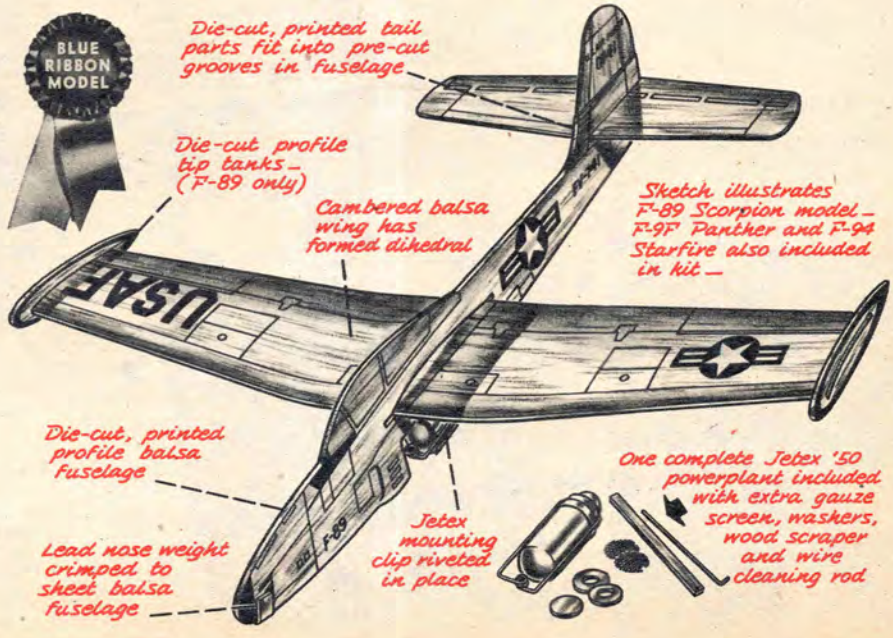
Although the models may be flown without doing so, it is recommended that a bit of cement be used to fasten the tail parts in place, so adjustments may be retained.

The fuselages have metal weights at the nose, and the wings are marked with the approximate balance point. Final check of balance, of course, is made when the models are finished and glide-tested.

All wooden parts are printed to simulate the insignia, seams, jet intakes, etc. of the large planes. The parts are also all marked so that the uninitiated will have no difficulty matching up the units of each plane properly.

Full instructions are furnished for the Jetex motor, as are maintenance parts, but there is no fuel. (You don't get fuel with the average kit. In fact, you don't even get a motor!) This assembly set is especially attractive, since the motor may be slipped instantly from one plane to another.

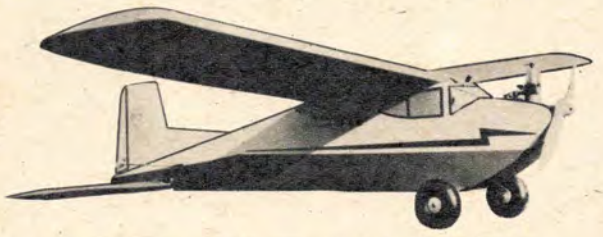
Because of the fact that the three models are completely cut out, and slots are provided for all mating parts, no plan sheet is included in the kit. There are assembly and flying instructions on the box, however. Fuselages are cut away as needed, to clear the Jetex unit, but the overall appearance is remarkably lifelike. Instructions state that when properly assembled, adjusted and flown, the little jet jobs are capable of attaining 500 feet altitude, from which height they will glide for up to 5 minutes, before again returning to ground level. Quick assembly, slow glide!


BLUE RIBBON MODEL
Die-cut, printed tail parts fit into pre-cut grooves in fuselage
Die-cut profile tip tanks—(F-89 only)
Cambered balsa wing has formed dihedral
Sketch illustrates F-89 Scorpion model—F-9F Panther and F-94 Starfire also included in kit—
USAF
Die-cut, printed profile balsa fuselage
Lead nose weight crimped to sheet balsa fuselage
Jetex mounting clip riveted in place
One complete Jetex '50 powerplant included with extra gauze screen, washers, wood scraper and wire cleaning rod

RADIO CONTROL MODELS

THE FABULOUS "LIVE WIRE" R/C MODELS

LOOK TO "DMECO" FOR THE TRIED AND PROVEN LEADERS IN THIS FIELD!



LIVE WIRE "TRAINER"

This is the model especially developed for R/C training. It uses .09 to .15 engines and carries any reliable radio setup with ample battery supply in its removable radio unit. Complete building and radio instructions furnished. Simple, rugged sheet balsa construction makes a fine long lasting model, a really complete kit in every way! $6.95

LIVE WIRE "KITTEN"

Here is a 100% R/C model for the popular ½A engines. Designed around the new light weight 27 mc. radio, its performance is hailed as outstanding! This is your model for fun and restricted area flying, complete building and radio instructions furnished. Another fine kit complete in every way! $3.95

LIVE WIRE "SENIOR"

For those who wish the ultimate in R/C flying this "Custom Built" .19 powered "Senior" is for them. A real contest performer capable of using anything from a simple single channel radio to the fabulous 5 channel tone systems, terrific results with any of them! Complete building and radio instructions furnished, it also uses a removable radio unit. A "one of its kind" custom built kit. $14.95

R/C MODELS ARE DIFFERENT!

The flying of radio controlled models is the closest approach to real flight possible. With simple radios and rudder control only, today's modeler can perform 90% of the flying possible with full scale planes! Yes, he can take off a runway under full control, fly to where he wishes, execute maneuvers, return to the runway and land right at his own feet! The fact is that this is being done every day by thousands of flyers of all ages, really the ultimate in model flying!

Dmeco's "Live Wire" models have been developed exclusively to use the radio equipment to best advantage and to give the finest flying possible. Contrary to what may be thought, it takes specially designed models to fly R/C successfully. The "Live Wire" is the leader of these special designs having been under intensified development for over 18 months until it met all R/C requirements. Now, from field reports it is known that they are doing a fine job the world over, winning contests and training more R/C pilots than it was ever thought possible! The special R/C flight characteristics of the model make it simpler to learn with and easier to win contests when flying a "Live Wire"! Step into your dealers today and examine one of these truly deluxe kits, complete in every way to fill the desire of the most discriminating modeler!

FREE! SEND FOR BOOKLET ON RADIO MODEL FLYING!

DE BOLT MODEL ENG. CO.

WILLIAMSVILLE N.Y.

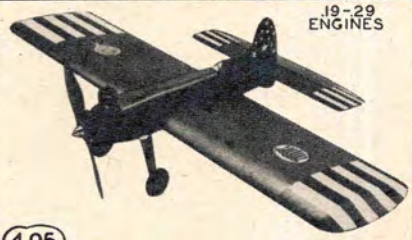
.06-.09 ENGINES

2.50

"All American Jr."

The number 2 model of the All American Training Team is this stunt-trainer designed around the popular .09 engines. Learning stunt flying becomes simple with this correct combination, slow enough to learn with, yet responsive to keep you out of trouble!

.19-.29 ENGINES



4.95

"All American"

The number 3 model of the All American Team is a full stunt model using dmeco's exclusive "Assymetrical Stability." Developed around the new powerful .19 engines, independent tests have shown it to be a very outstanding precision flight model. Simple straight forward assembly have made it a favorite with those who want superior performance with the least amount of work.

NATIONAL SR. COMBAT CHAMPION!

1/2A

LIVE WIRE "CLIPPER"

FOR PAA & FREE FLIGHT EVENTS...

Beginners in free-flight or experts looking for an easy to handle design will find this realistic looking model ideal for them. Use it for PAA load and regular free flight events. 2.95

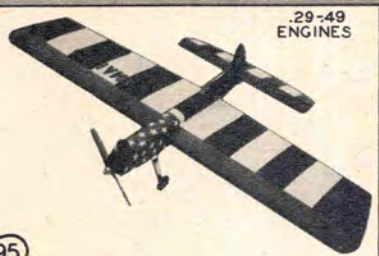
.19-.29 ENGINES

3.95

"Sportwing"

Here is a model that is as modern as the new sports cars, yet it is a design that has been tried and proven to be outstanding in every respect. Especially suited to stunt and combat the kit is quickly assembled from finished parts using alignment jigs that assure a perfect model every time!

.29-.49 ENGINES



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"All American Sr."

The "Star" of the All American Team is this contest winning "Senior," here is the model that even beginners can fly to first place laurels! The design is the culmination of years of effort to provide a fine high performance model that is simple to assemble, easy to maneuver and a cinch to win for you in any competition! Dmeco's exclusive "Assymetrical Stability" provides the means to such fine performance from a model with so little power.

NATIONAL JR. STUNT CHAMPION!

CHOOSE YOUR KIT THE WAY THE EXPERTS DO!

USES ANY 1/2 A ENGINE

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"Infant WAGON"

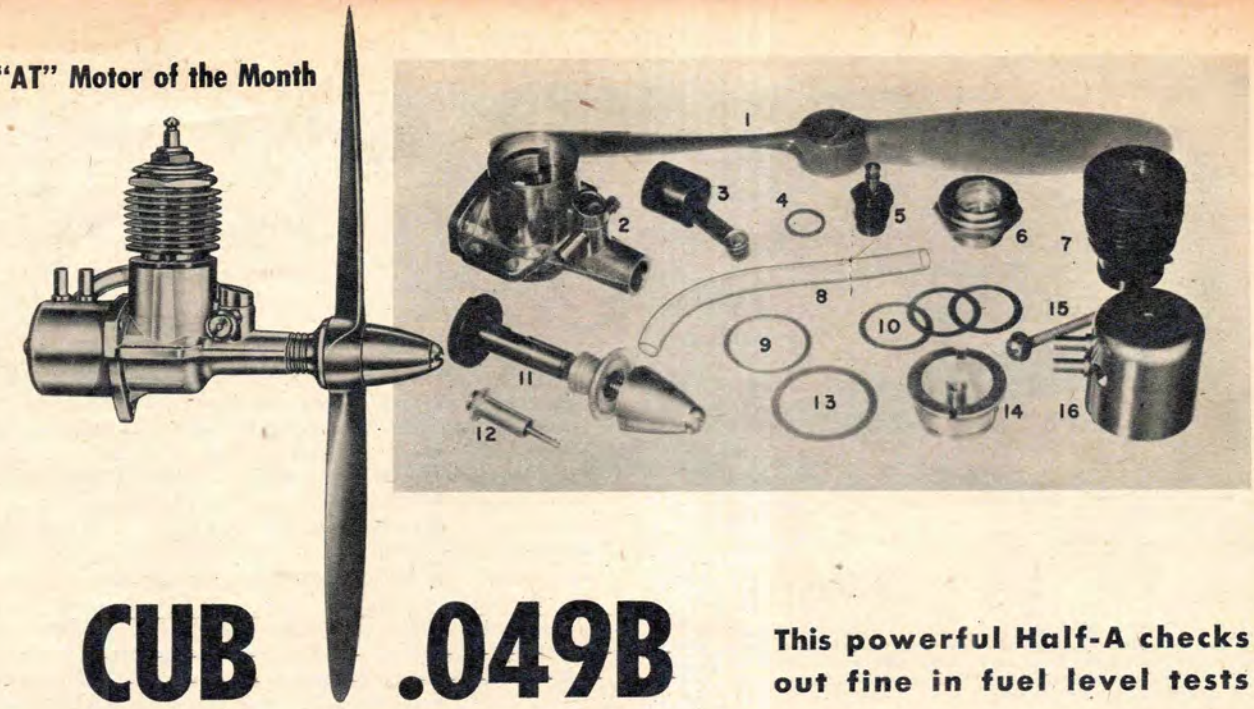
The ready to assemble ALL BALSA stunt model for all ½A engines. It has been accepted as one of the most efficient, rugged and maneuverable models in its class by those who should know!

WITH THE EXPERTS "DMECO KITS" ARE TOPS!

PRODUCTS OF
THE DE BOLT MODEL ENGNR. CO.
WILLIAMSVILLE, N.Y.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

An "AT" Motor of the Month



CUB .049B

This powerful Half-A checks out fine in fuel level tests

■ The famous OK Cub .049 series of engines has a new member of the family, attractively packaged and called the .049B. This engine has both radial and beam mounts, a double fuel tank and many other features that make it most convenient for any type of installation. It is lighter and more powerful than the original .049 Cub.

The propeller has been moved forward with an extension drive washer, to give plenty of finger room in adjusting the needle valve. The internal construction is very much like the .049X racing engine. Plastic propeller and aluminum spinner are standard equipment with each engine. The fuel tank is held on to the back of the engine with one machine screw attaching to the rear cover plate and can be removed in a few seconds. The fuel tank gasket is also the rear cover gasket and cannot be lost, so that the tank may be attached later without difficulty.

Inside the engine performance is stepped up over the old .049 by using a square rotary valve in the crankshaft. The inside bore of the carburetor is round at the top but changes to a rectangular opening as it reaches the needle valve and remains rectangular down to the rotary valve. This design gives faster and more positive valve action for increased power and easy starting. The crankshaft is made of hardened steel, ground to an excellent finish on the bearing surface and knurled at the front to fit the drive washer.

The cylinder is machined from solid steel and threaded on the lower end where it attaches to the crank case. Three exhaust ports are reamed on the sides of the cylinder leaving triangular webs which contain six base ports. The ports are fitted by a circular channel around the cylinder which connects to the base through milled passages on each side of the engine. This fuel transfer design has been patented by Herkimer and gives very efficient scavenging. The cylinder head screws onto the top of the cylinder and is sealed with thin copper gaskets. This .049B engine may be adjusted for racing or speed flying by adding or removing gaskets as desired.

The engine test was run with OK Cub Fuel. This mixture has been developed to give best performance in Cub engines and is hard to match for better results. If the engine is hot the prime should be omitted since it will flood the engine quickly. One choke is usually sufficient for starting hot. After one-half hour of running the engine had reached its peak rpm and seemed to be really broken in, since further running produced no increase in rpm. Top speeds on the .049B were comparable to the .049X, but the fuel suction is greater, indicating that it would be most satisfactory as a speed type engine.

Parts Illustrated

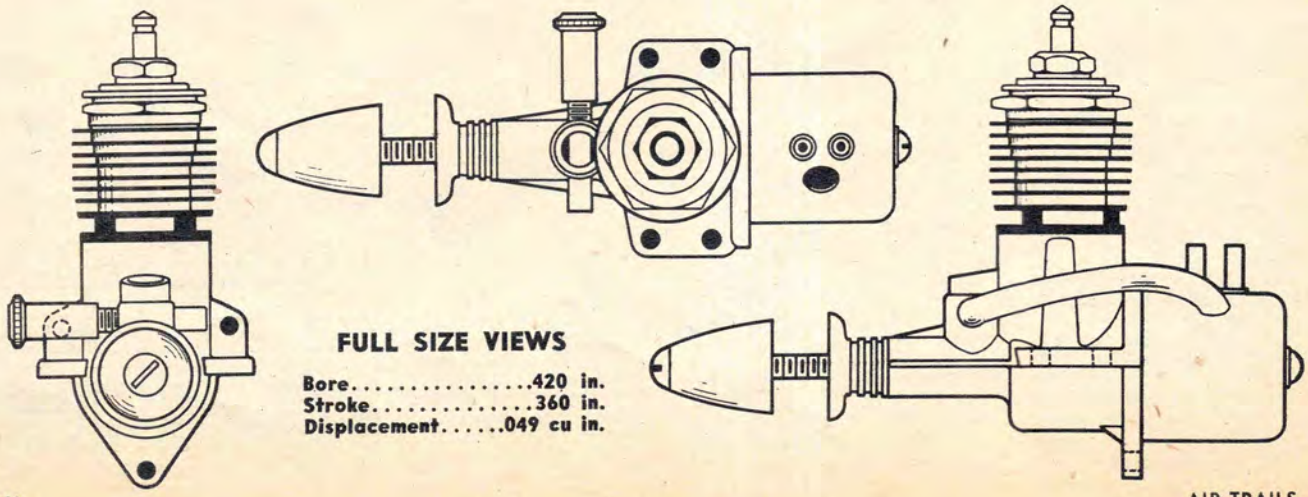
1. Propeller: 5½/4 plastic, .17 oz. 2. Crankcase: aluminum die casting, .31 oz. 3. Piston: steel-hardened and ground, .420″ dia. x 13/32″ long, .10 oz. Connecting rod: aluminum, 23/32″ long, .02 oz. Wrist pin: steel, .110″ dia., .02 oz. 4. Glow plug washer: copper, .01 oz. 5. Glow plug: steel, ¼-32 thread, .10 oz. 6. Cylinder head: aluminum, .08 oz. 7. Cylinder: steel, .420″ dia. x 15/16″ long, .34 oz. 8. Fuel line: plastic, 3/32″ inside dia., .03 oz. 9. Cylinder gasket: copper, .005″ thick. 10. Cylinder head gasket (3): copper, .005″ thick. 11. Crank shaft: steel-hardened and ground, .218″ shaft, .125″ crank pin, .15 oz. Drive washer: aluminum, 9/16″ dia., .02 oz. Spinner: aluminum, ½″ dia., .02 oz. Propeller screw: steel, 5-40 NC thread, .06 oz. 12. Needle valve: steel & aluminum 1/16″ needle, .02 oz. 13 Back cover & tank gasket: fiber, 1/64″ thick. 14. Back cover: aluminum, .10 oz. 15. Tank screw: steel, 3-48 NC, .02 oz. 16. Fuel tank: aluminum, ¾″ dia., .10 oz.

Engine Data

Performance. Bare weight, less tank: 1.27 oz. Propellers: 6/3 wood, 11,900 rpm; 5½/4 plastic: 13,500 rpm; 5¼/4 wood: 14,600 rpm; 5/3 wood: 16,200 rpm. Fuel level test: 8″ at 13,500 rpm. Fuel: OK Cub.

Design Data. Displacement: .049 cu. in. Class: ½A. Stroke: .360 in. Bore: .420 in. Stroke bore ratio: .857. Compression ratio head: 6.0. Compression ratio base: 1.44. Port area intake: .0234 sq. in. Bypass: .0161 sq. in. Exhaust: .0513 sq. in. Ignition: OK glow plug.

Construction Features. Beam and radial mount. Fuel tank that can be removed. Propeller and spinner supplied. Square rotary valve and carburetor port.



FULL SIZE VIEWS

Bore.....420 in.
Stroke.....360 in.
Displacement.....049 cu in.

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The BIG BARGAIN of '53!

Imagine! This COMPLETELY CARVED BALSA FUSELAGE MODEL ONLY $1.50

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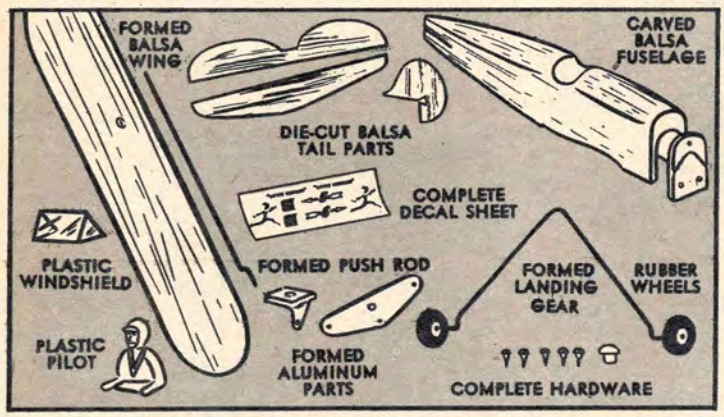
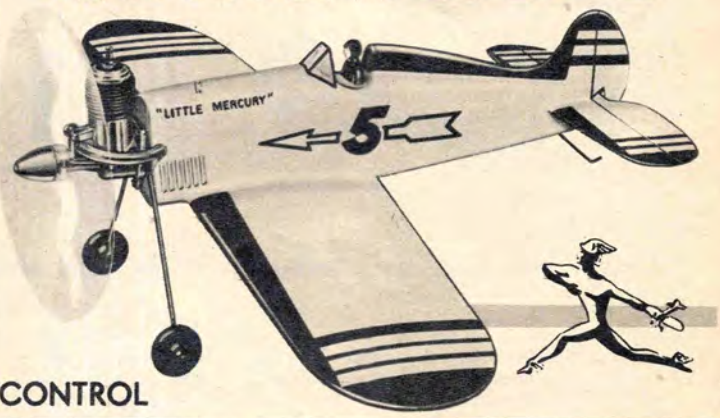
JUST LOOK AT ALL THESE EXTRA-VALUE FEATURES!

LITTLE MERCURY





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SPAN: 17½" For .020 to .074 Eng.

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SPAN: 18" For .020 to .074 Eng.

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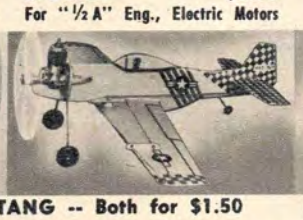
BUCKEYE SR. $4.95
LENGTH: 17" For .099 to .29 Eng.



F-86 SABRE & F-51 MUSTANG -- Both for $1.50
Our sensational 2-in-1 kit. Contains two complete, realistic profile models.

BUCKEYE JR. $3.95
LENGTH: 14" For .020 to .074 Eng.

CO_2 SQUIRT $1.50
"½ A" Eng., CO_2, or Elec. Motors

SEA HAWK $2.50
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LITTLE MUSTANG $1.95
SPAN: 18" For .020 to .074 Eng.

CESSNA "170" $1.95
SPAN: 22" For .020 to .074 Eng.

PIPER CUB $1.95
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STINSON VOYAGER 1.95
SPAN: 22" For .020 to .074 Eng.

½-PINT RACER $2.95
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SPAN: 18" For .020 to .074 Eng.

LITTLE ACE $1.95
SPAN: 18" For .049 to .099 Eng.

BEL AIR $2.95
SPAN: 18" For .039 to .099 Eng.

BEECHCRAFT "17" $2.95
SPAN: 16" For .045 to .099 Eng.

FREE! Scientific's brand - new Spring-Summer catalog is just off the press. It's now available at your dealers or by writing direct.

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See the complete line of Scientific models at your favorite Hobby Shop.

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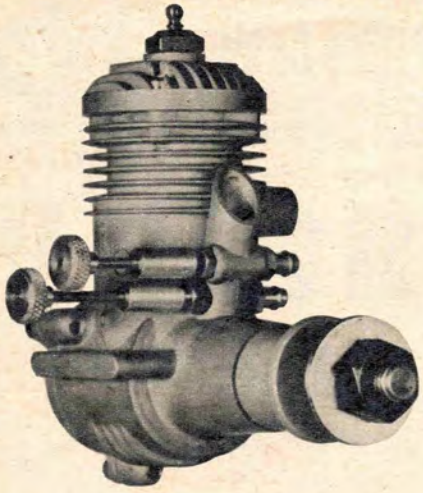
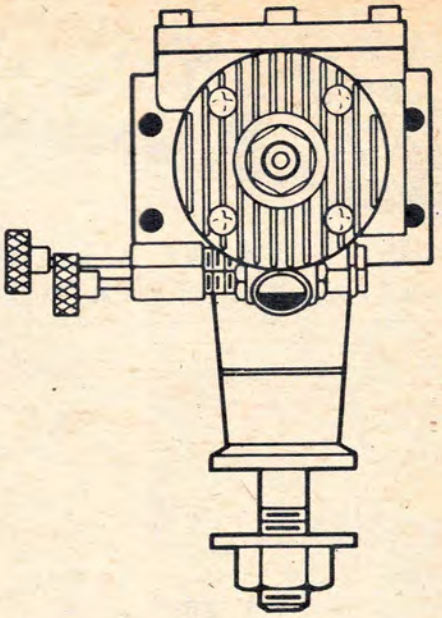
AN "AT" MOTOR OF THE MONTH



CAMERON 2-SPEED .19



Latest offering by Cameron Clan will delight R/Cers

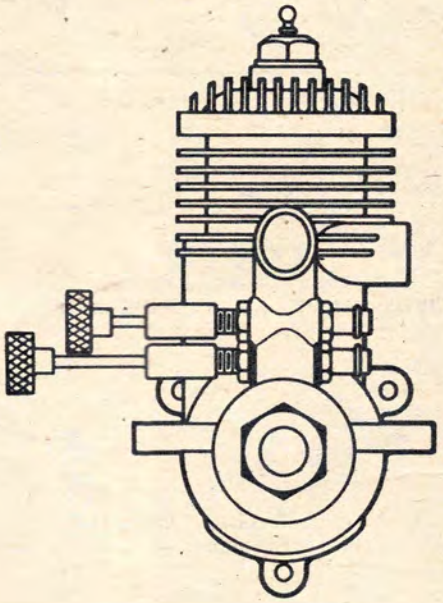
■ In response to the growing demand for two-speed engines for radio control and carrier flight operation, Cameron Precision Engineering has made its new .19 engine available in a two-speed model. The modeler who may intend to go in for two-speed work in the future can purchase the Cameron .19 double needle valve engine at a small additional cost, and use it as a standard engine with no difficulty and then connect the two-speed system at any time.

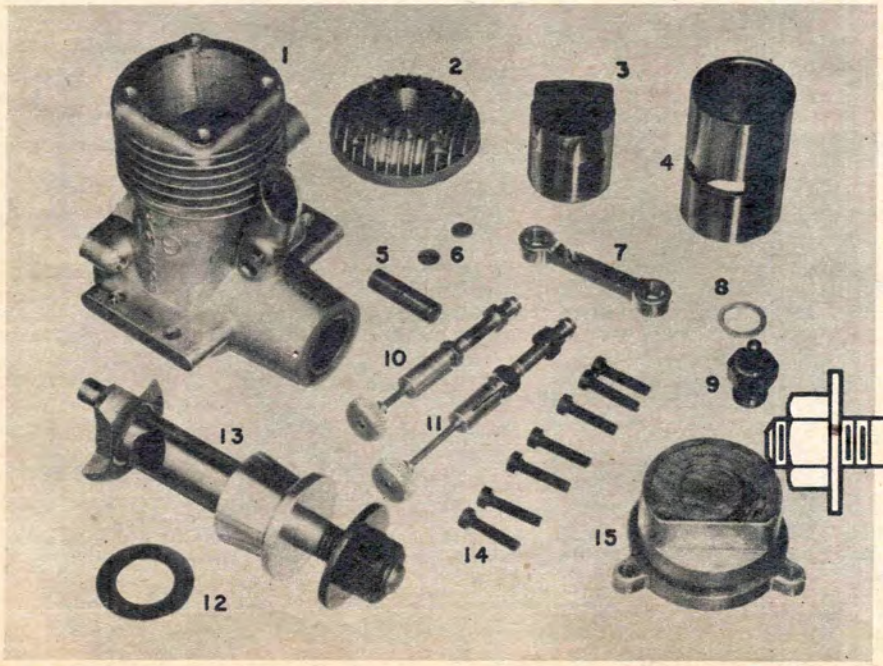
Two speeds are obtained by using double needle valves as developed for the Bonner radio control equipment. One needle valve operates the engine at normal speeds and is usually the one closest to the engine. Low speed is obtained by setting the other needle valve extremely rich. Opening a small air vent in the low-speed line allows air to be drawn into the top needle valve rather than fuel, and puts the engine into high-speed operation. Closing the vent again establishes the suction back to the fuel tank and the engine changes to slow speed.

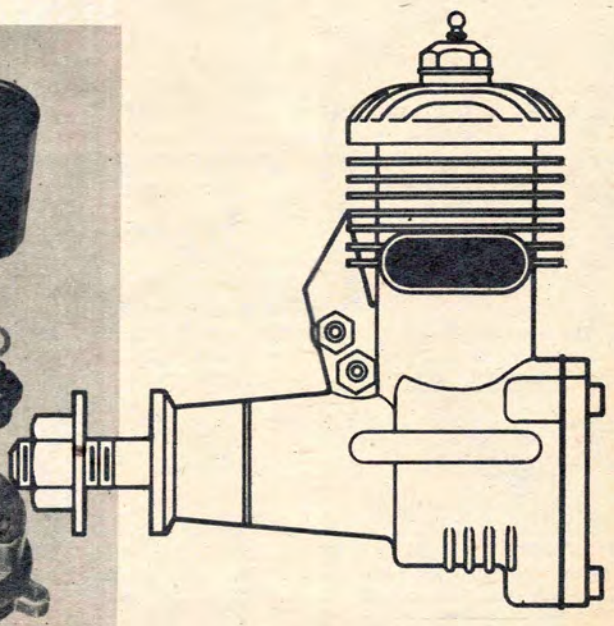
In making the connections from the tank to the engine, a tank with two fuel suction lines must be used. One line goes directly from the high-speed needle valve to the tank, the other line connects to the upper or low-speed needle valve and then to a small "T" fitting and to the tank. The side branch of the "T" fitting acts as the air vent and should be as close to the needle valve as possible to reduce the amount of fuel remaining in the lines after the vent is opened to select high speed.

Internal construction of the Cameron .19 two speed is the same as the standard .19 engine. A hardened and ground steel piston with a curved, milled baffle is used in a steel liner. This combination gives excellent wearing qualities but requires considerable time to break in. A notch cut in the lower end of the hardened liner fits over a pin in the crankcase so that the liner cannot be placed in any but the correct position. A hardened steel wrist pin is used in the piston with brass plugs at each end to prevent scoring the cylinder.

The crankcase (*Continued on page* 72)







FULL-SIZE VIEWS

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SINCE 1934
OHLSSON
Gold Seal
OHLSSON DIESEL FUEL
"The ignition is in the fuel."
OHLSSON GOLD SEAL DIESEL FUEL
is formulated for all model diesel (compression ignition) engines. The continuous use of Ohlsson GOLD SEAL Diesel Fuel will prevent the formation of varnish, gums, sludge and carbon in your engine and reduce engine wear to a minimum.
Half Pints 55¢
Pints 95¢

Hilt Tupman, Lincoln-Mercury dealer, and Irwin G. Ohlsson discussing $5000 Slogan Contest.

Send in your slogan now!... with coupon from top of can (Diesel or Glo Fuel).

OHLSSON $5000 GOLD SEAL SLOGAN CONTEST

Win this new 1953 Mercury. 25 additional prizes including 21" TV Sets, Bicycles, Radios, Wrist Watches, Cameras and other valuable prizes.

Send in as many slogans as you wish but keep them short (10 words or less preferred). Get full details from your hobby dealer.

..."you won't believe it 'til you try it"

OHLSSON GOLD SEAL DIESEL FUEL

This sensational new Diesel Fuel now makes the diesel—the *easiest starting* model engine.

Newly developed chemicals used in Ohlsson GOLD SEAL Diesel Fuel are the magic ingredients that make engines start easier, run smoother—deliver terrific power and better all-around performance. *It makes old diesels run like new and new diesels run better.* Team racers are finding that they get more mileage with Ohlsson GOLD SEAL Diesel Fuel than anything they have ever tried.

The Ohlsson Manufacturing Company in Long Beach which produces Ohlsson GOLD SEAL Fuels has no connection with any other firm.

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The SQUAW

Another fine "U" Control plane for smooth precision aerobatic flying. A wing area of 346 sq. in. with full span flaps and a wing span of 38 in. For engines ".19" to ".29" cu. in. displ.

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- BRAVE
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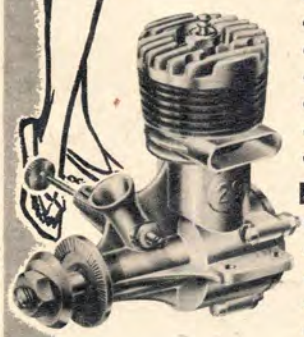

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The Champions' Boast from Coast to Coast!

An engine of quality packed with power.

For U control or free-flight use. Economical to operate and built to last.

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The world's largest and best line of rubber tired wheels for models. Authentic die-cast hubs add that finishing touch to make the model have scale appearance.

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Veco control accessories are well known by the experienced modelers as being engineered for the smoothest operation.

ASK YOUR DEALER TO SHOW YOU THE FINE LINE OF VECO PRODUCTS

VECO PRODUCTS

HENRY ENGINEERING COMPANY

BURBANK, CALIFORNIA

Air Force Filter Center Manned by Cadets (above): In Albany, N. Y., CAP Cadets are manning the AF Filter Center on week ends when it is difficult to obtain civilian volunteers. Supplementing radar observations, the Filter Center accurately checks and tracks on its plotting boards all aircraft movements reported by the Group Observer Corps stations. Number, type, course and elevation are carefully observed, reported and then plotted on the Filter Center map.

The Cadets are thoroughly briefed by Center personnel. This training is supplementary to their regular CAP training and studies.

Mass. High School Completes CAP Course (below): The Groton High School, Groton, Mass., was the first high school in the state to complete its aviation course based on the CAP Aviation Study Manual. This was offered to 200 students. It is part of the program to include the CAP course in high school throughout the state.

International Cadet Exchange. A hundred twenty Civil Air Patrol Cadets from the 52 wings came to Washington July 19 to launch the 1953 International Cadet Exchange. On July 23 a like number of young men from 16 foreign nations arrived in Washington in the second phase of the exchange.

Civil Air Patrol Cadets participating in the exchange were honor Cadets of their wings and underwent exhaustive screening prior to their selection. Beginning at the squadron level they met a series of boards called to consider their qualifications for this honor, one of the highest which can come to a CAP Cadet.

From the 240 names finally forwarded to National Headquarters at Washington, the 120 participants were selected.

Similar systems were used by the other nations taking part in the exchange to select their participants. Quotas for foreign exchange representatives are five per nation with the exception of Great Britain and Canada. These nations both have cadet organizations similar to CAP and are given quotas of 25 each. Representatives of the other nations are all youthful aviation enthusiasts chosen by the aero clubs and flying organizations in their homeland for sponsorship.

Both the CAP Cadets and the foreign youths had three-day stays in the Nation's capital before continuing on their exchange itineraries. Here they were guests of the National Capital Wing. The U. S. group then left for the exchange nations —a small group to each one. Foreign participants were divided into small groups, each going to one of 16 host wings. They were reunited in New York City for a three-day stay there before leaving the United States for their homelands.

The exchange, now in its sixth year, was originally created to foster international brotherhood among air-minded youth of the free world. The participants are in effect young good-will ambassadors for their individual nations.

Air Trails RADIO CONTROL MODELS

McENTEE ON R/C: Club and Contest Reports; New Ideas

General News. Dale Springsted (W2GRI, Schenectady, N. Y.) is active on 40 meter phone and anxious to contact other ham R/Cers. One of the oldest (in line of experience!) R/C flyers in the area. Dale says other active flyers are Dick Ryan, Bob Wells, Ray Voight, William D'Arneau and Leo Fowler. Equipment is mostly Aerotrol and Control Research with rudder only. While a little work on multi-controls is under way, most of the groups are working toward the utmost reliability before turning to more complications.

About six fellows fly R/C ships every Sunday at an abandoned airport, according to Samuel C. Allen, 860 N.E. 99 St., Miami 38. Several of the planes are equipped with pulse control. More R/C flyers will be welcome.

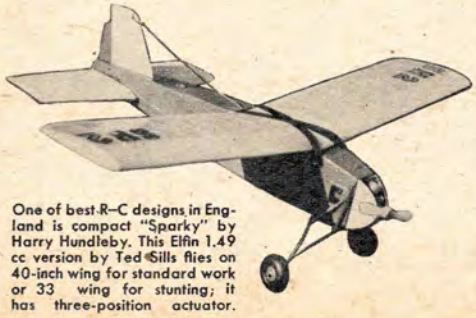
Gene Bohn, 1824 12th Ave. N. Grand Forks, N. D., is trying to locate other flyers in his area who are interested in R/C. Gene, who is 14½, has several engines and planes, and is studying for a ham Novice license. He wants company!

Arthur W. Brook, Bossier City, La., says there are about eight R/C flyers in the Shreveport area. Art is moving away from gas tube sets; hope he tried Simple/Single.

Kale L. Harder (3401st Student Training Sqdn., Keesler Air Force Base, Miss.) has been a ham since '45—call is W9WZA. He now flies a 6 ft. original and took 4th place at recent Ft. Worth meet. Uses Citizen 465 and Compound esc. with 2-speed control. Would like to hear from R/Cers around Keesler.

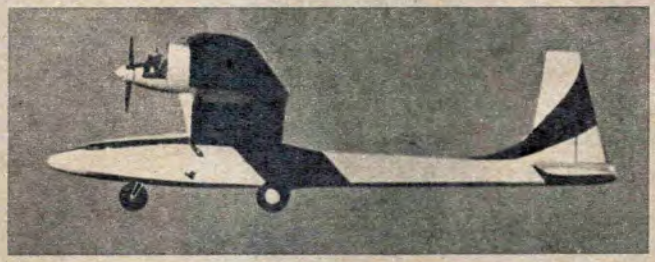
F. H. Reingold, Sioux City, Iowa has converted Live Wire Sr. to trike gear with good results. He moved the regular L.W. gear to back of cabin and added a nose wheel. Says it looks and works fine, but he had to add 6 oz. weight to nose for balance. Ship now scales 4 lb. 2 oz. F. H. runs the Hobby Shop at Olson Sporting Goods Co., says it keeps him jumping to keep ahead of the R/C boys!

We learn that a Russian modeler has been given the official FAI title for R/C endurance flight, superseding record made by Walt Good in 1952. The time was 1 hour, 2 min., and the same flyer also set up records for altitude (2800 ft.) and speed (24 mph). It is not clear from advance reports if the same ship (*Continued on page* 55)



One of best R–C designs in England is compact "Sparky" by Harry Hundleby. This Elfin 1.49 cc version by Ted Sills flies on 40-inch wing for standard work or 33 wing for stunting; it has three-position actuator.

Above is first USAF photo of a Sperry-controlled QF-80 pilotless jet (599) and its DT-33 director craft with a "beep pilot" aboard. This was take-off for successful remote flight through extreme turbulence of atom cloud. At right are the group "beep pilots" completing a pre-flight check. Signals are given via radio and radar, through "Beep Box" controls at two ground stations or from the director plane. Complete system of Sperry robot controls enables pilotless versions of F-80s to take off, & land, keep accurate flight patterns.



K. J. Jewett of North Hollywood, Cal., built this gull wing R/C which he says is "not a powered glider." Trike gear; gull is to get wing up closer to thrust line. The craft also free-flights nicely.

R/C midwing model by Major H. M. Bourgeois, USMC. Arden .09, all-balsa sheet covered, dural gear, 2-tube 54 mc rcvr, 5 position escapement; 3¾ lbs.

Realistic R/C Semi-Scale:

wonderwings

Fast, maneuverable bipe for stunt work will bring you plenty of compliments and many hours of flying fun

By S. CALHOUN SMITH

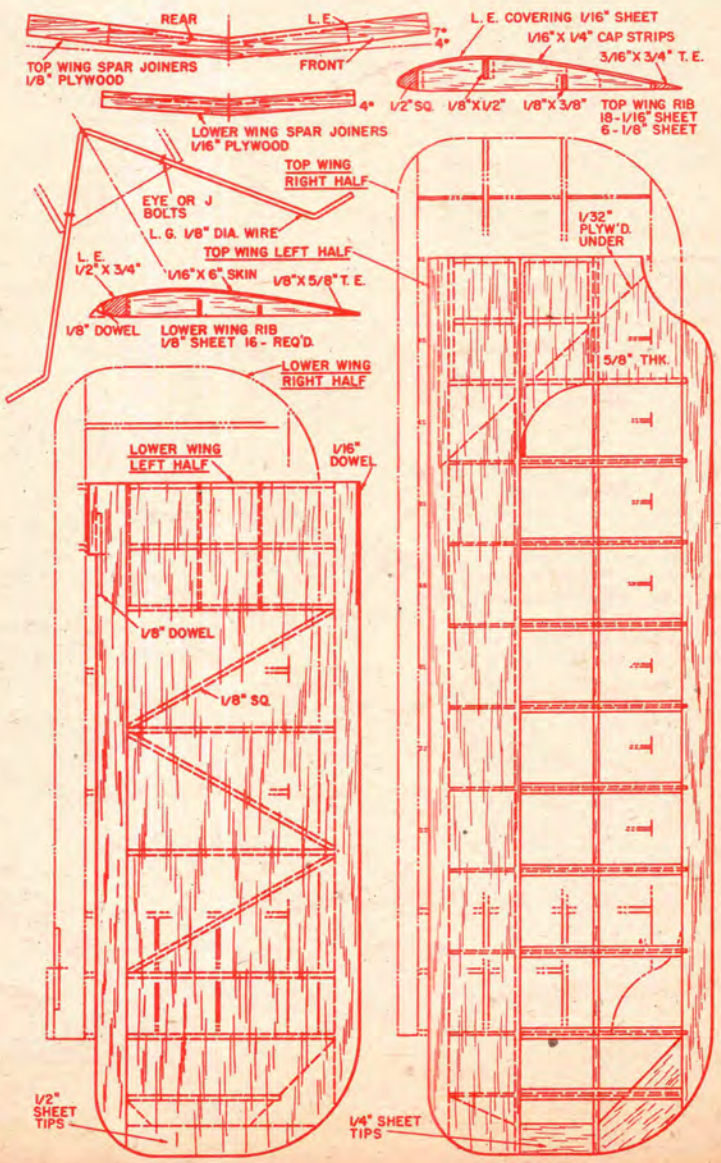
"Big Jim" Patmore launches pylon version; Macnabb 27 in hand.

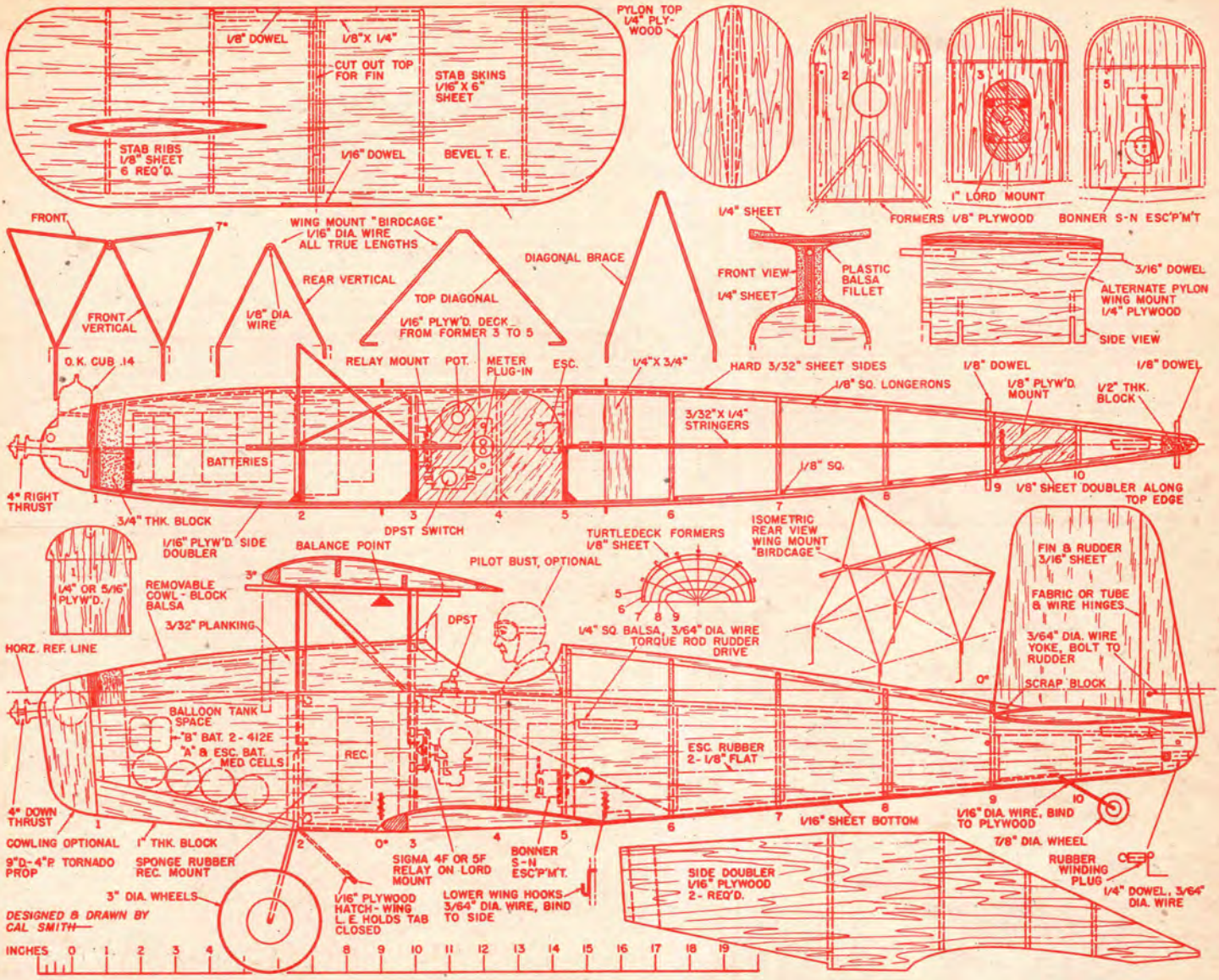
Wire birdcage wing mount job; Cal's abode & souped Studie, right.

Now, we ask you, have you seen a prettier radio plane? Not only does she rate high in appearance, but she's a rugged beauty, too. The photo below is bottom of fuselage with lower wing removed.

■ Biplanes have long been the step-child of free flight, and we haven't heard of any rash of them breaking out in R/C, either.

Here's an attempt to change all that! It was felt that the biplane configuration should be well suited to R/C flying for a number of reasons. The biplane has been a top-notch stunt airplane in full-scale aerobatics, so obviously the type would seem well suited to R/C





stunting. The biplane packs a lot of wing area into a small space, making transporting easier. Biplane flight characteristics are well suited to R/C flying, notably stall recovery is much smoother than monoplane, and the extra drag slows speed a bit so that the model can be kept in close for maneuvering. A short-coupled model such as this can turn on a dime, and has a snappy roll tendency.

It would seem that all these factors might add up to a pretty wild flying machine, but experience showed just the opposite. When properly adjusted—repeat—*when properly adjusted* this ship left little to be desired in the rudder-only flying department and is a veteran of months of Sunday afternoon flying sessions.

Wonderwings has taken its share of bumps and cartwheels too. Its structure was designed with a view to withstanding all the hard knocks test flights could give, so that something would be left for flying when adjustment and trimming were completed.

Liberal use of plywood and Weldwood glue is the answer for crash resistance and as a result this ship is rugged—no foolin'.

Making the biplane setup fly well is controlled by the wing-tail incidence and proper C.G. location. Free-flight maestro Frank Ehling showed us the proper set-up for this ship, so if the redesign bug hits you read just one more sentence, please. Don't change the incidence angles of wings and tail from those shown on the plans!

Model specifications are span 44", length 34", total wing area 480 square inches, weight 46 oz., wing loading is 9.5 oz./100 sq. in., and power loading is 328 oz./cu. in. with the .14 engine. The ship has been flown with a throttle-down Arden .19 and results were frantic, to say the least. An .09 engine would not be quite enough power at present weight.

Plans differ from the original model a bit, but the changes are for your benefit and will not affect flying. The nose was lengthened ½" to move battery weight forward a bit for proper C.G. position, 1½ oz. of lead was carried in nose originally. Wheels are bigger, 3" dia. instead of 2½". Fuselage width increased from 3" to 3½" to allow more payload room.

R/C flying has been done with home-built RK61 two-tube receiver on 27¼ mc. The sponge-rubber receiver mount is standard practice and is fine for crash resistance. Batteries in forward compartment are packed tightly in sponge rubber to prevent their flying around in a crash. We prefer the separate relay mounting to subdivide weight of components and the Lord mount takes care of vibration problems. Both E.D. Mk III and Bonner escapements have been used, and rubber drive is popular torque rod linkage.

Construction follows accepted free-flight practice with a few wrinkles thrown in (*Continued on page* 66)

R/C NEWS

Details and Accessories

Vern C. Macnabb

A good radio such as **CITIZEN-SHIP** is the starting point for successful RC flying.

However, many other details must be carefully observed to insure successful flying.

Loose connections are one common cause of failure. **CITIZEN-SHIP** Receivers provide Fahnestock Clips for making connections from the set to batteries and actuator. Aside from soldering there is no other connecting means as reliable. Plugs and sockets (excluding military types) should be used with caution and add unnecessary weight.

Another cause of failure are run down batteries. A good meter is needed to know the condition of all batteries, transmitter and receiver, at all times.

The **CITIZEN-SHIP** Test Meter is an especially designed multimeter to read ALL voltages of both receiver and transmitter and is also a milliammeter for checking plate current change and relay settings. **CITIZEN-SHIP** Test Meter is a MUST for successful RC flying. It accurately shows the following readings:

PLATE CURRENT	**0-1.5 MILLIAMPERES**
FLASHLIGHT BATTERIES	**0-1.5 VOLTS**
FILAMENT VOLTAGE	**0-6.0 VOLTS**
"B" BATTERY VOLTAGES	**0-150 VOLTS**

The **CITIZEN - SHIP** test meter is supplied with a PLUG to be attached to the milliammeter leads and a JACK to be mounted on the airplane. VOLTMETER LEADS are also included. Nothing else to buy—everything included for.... **$19.95**

The only producer of equipment for BOTH CITIZENS BANDS 465 mc and 27.255 kc

CITIZEN-SHIP "27" LR, RECEIVER, for use on 27.255 kc..... **$24.95**

CITIZEN-SHIP "27" LC hand held TRANSMITTER for use on 27.255 kc. With tubes and crystal, price less battery..... **$39.75**

RECEIVER model CR for 465 mc Citizens band; ready to "fly out of box"..... **$29.95**

TRANSMITTER model CC for 465 mc band, price less batteries..... **$39.75**

Citizen-Ship SN escapement..... **$ 9.95**
Good Bros. 4 position escapement..... **13.50**
Citizen-Ship Test Meter..... **19.95**
Bell Crank and Rudder Horn..... **.75**

CITIZEN—SHIP RADIO CORP.

909 Westfield Blvd., Indianapolis 20, Ind.

BUG HUNTING

■ It isn't any time at all after you get into R/C that you begin to encounter "bugs." Bug-hunting is a universal R/C pastime, and new bugs crop up every day. Each one adds just that much to your experience; you learn to recognize them when they repeat, and can then save time in extermination. Here are a few of the more common bugs. Remember that some bugs can be kept out of your hair by a little preventative maintenance. For example: Relay contacts will get dirty in time, and your escapement or actuator may not operate reliably. This problem may be alleviated by making it a practice to clean the contacts at regular intervals, say, every two weeks. And *don't* do this with a file! Cut a strip of clean bond paper about ¼" wide and 2" long, and draw this

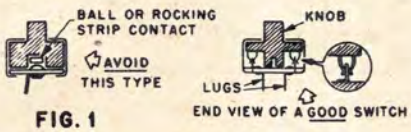


FIG. 1

between the contacts, while you press them together with your fingers.

Most R/C flyers have learned to make careful distance checks at frequent intervals, as the best way to check operation of both transmitter and receiver. Some aren't as careful with battery tests, though. Batteries should be checked before each flying session, and checked under load. It does little good to test them when not in use, with the usual high resistance meter; the safest way is to have them operating in their normal circuit positions, when the receiver or transmitter will supply the needed load.

When building equipment, remember that the parts you buy are not always exactly what you specify; all small parts such as resistors and condensers are sold not at exact values, but to a certain "tolerance." This means that they can vary considerably from what you order. The standard resistor tolerance is 20%; that resistor you have which is marked 100,000 ohms can thus be anything between 80,000 and 120,000 ohms. In most cases this makes little difference; if more exact values are required, article authors will usually tell you so. One more point; it is not unknown for these small parts to be incorrectly marked. The dealer seldom tests when he sells them, so if you have built a unit that just won't work, yet all parts are new and marked as they should be, try to get them checked, or substitute others.

Soldered joints are prolific trouble spots; much has been written about "cold-soldered" joints, which simply means joints that have not had enough heat applied to properly melt the solder. Cold joints usually break apart under vibration. And then we have the matter of acid core solder; this stuff is fine for joining music wire landing gear parts, *but keep it away* from any electrical connection.

A solder job is often required at the flying field, and many builders do not know they can obtain 6V. irons that work right from a car storage battery; lots better than having to drive home to make a minor repair!

Installation Bugs. 1. We've mentioned it before, but it keeps cropping up again. Some kinds of slide switches are just plain *no good.* Use only the kind that have double wiping contacts, as in Fig. 1. Avoid those with ball contacts, or internal contacts that you can't see. Most toggle switches are OK, but they are heavier, of course.

2. Be sure your escapement is firmly mounted, if it is the single hole mounting type. See Fig. 2; an escapement fastened this way won't turn under vibration and throw your rudder positions all off.

3. Some receivers work fine on the test bench, but get very balky when installed in a plane. One cause is that wiring in the plane acts as additional antenna, and the receiver is just plain overloaded. This is especially true in large planes, where there are long leads to an escapement in the tail, or maybe a long metal pushrod to the rudder. All such metal appears to the receiver as more antenna, if it is tied in to the set. And don't forget, it must be considered tied in, even if there is no direct connection, through the effects of capacity (capacitance) in such units as the escapement.

4. Long metal push or torque rods can cause another elusive bug. This one usually shows up only when the motor is running; everything works fine with engine stopped. The various mechanical joints in the control system are the culprits; they cause "electrical noise" under motor vibration. There are two remedies. You can "bond" the joints wth short lengths of very flexible wire, or you can put in insulation, so that there is no metal-to-metal contact. Trouble spots to watch are shown

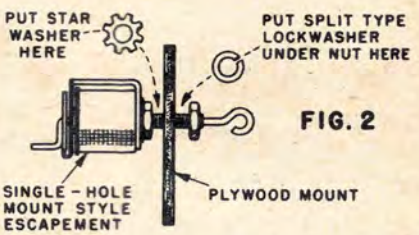


FIG. 2

in Fig. 3.

5. Vibration is a real enemy of receivers as we all know, but it can affect the receiver in queer ways. One of the most troublesome is to cause the relay to operate erratically; this is often the result of improper adjustment. Vibration has been known to render certain tubes useless, even though they work fine when the engine is not working. It can also shake the tuning coil of the receiver enough to make the circuit inoperative, so fasten every part down tight and with short leads.

6. When you install the receiver, keep the tuning coil, condenser, and tube away from large metal objects—such as batteries, etc., and don't run battery and escapement leads next to these parts. It is wise to separate the escapement and sensitive relay of the receiver by several inches: we have seen magnetic interaction render the relay very unreliable. Keep the lead to the antenna away from *all* metal parts and wires as much as possible.

Receiver bugs. 1. Keep the leads to your test meter *very* short. Remember that any wire you attach to the circuit in the plane looks like more antenna to the receiver; if your test leads are even a couple of feet long, it is apt to change the operation of the set enough to render any readings you make completely useless. If at all possible, attach your receiver test meter directly to a plug, and plug it in at the test jack, with no connecting leads at all.

2. Some receivers are bothered by the spark at the relay contacts, as the escapement is operated. This spark also dirties and wears out the contacts. It may be

eliminated by the simple circuit in Fig. 4A. If you use proportional control and utilize both relay contacts, try the one in B.

3. Hard tube receivers are coming more into vogue right now. Some of these sets are a little fussy as to tubes, and won't work well (or even work at all) with some makes of tubes, even though these tubes test OK, and will work perfectly in other applications. Receiver tubes seldom burn out in use, but they do go sour. If your set just doesn't seem to have the pep it should, try a new tube.

4. Most B batteries we now use are of the layer-built type. The cells are in the form of flat wafers, stacked up and held together with a tape wrapping. These batteries have been known to open up in use, particularly after a hard jolt. They can sometimes be made to work by pressing on both ends with the fingers, but such batteries should naturally be discarded, at least for flight use.

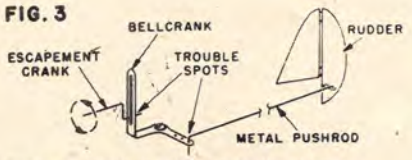
5. Users of polarized relays should check occasionally to make sure that metal filings have not been attracted to the armature or pole pieces. This can happen to any type of relay, of course, but the polarized style is most susceptible, due to the built-in permanent magnet.

Transmitter Bugs. Transmitters are normally lots more reliable than receivers, as they use larger parts, heavier batteries, and are not operated in a "critical" condition, as are the receivers. Most of the problems associated with them are due to improper tuning and antenna loading. There are some troublesome bugs, though.

1. If you can't always get your antenna to load properly, try setting the transmitter upon a yard square piece of chicken wire, or hardware cloth. Sheet metal is OK, but more bulky, unless you use aluminum foil and roll it up for carrying. This metal under the set ties it closer to ground, allows better loading and more signal will go out. It also makes the key lead less "sensitive"; when you move it around with the button depressed, the plate meter will not show so much variation.

2. Crystals can go bad after continued use, even though they have been working perfectly for some time. They do not "wear out" with use; if yours fails—and you are sure you have not "strained" it, it is probably defective, and you might be able to get a new one for it.

FIG. 3



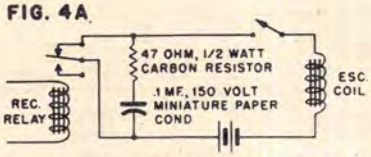
CHECK ESCAPEMENT SHAFT BEARINGS ALSO; A TOUCH OF GRAPHITED OIL MAY HELP THERE

3. When you pack your batteries into the transmitter case, make sure that the flexible leads do not drape themselves over the plate coil and condenser, or in fact, over any of the R.F. parts and connections in the circuit.

A final word on bugs from one who has tracked down and eliminated more of them than most of us will ever encounter. When he was asked for a few comments on R/C troubles experienced by beginners, Jim Walker wrote he felt a lot of their problems were due to: "1. Failure to make distance checks. This seems to be a growing tendency and is usually caused by laziness or impatience to get into the air. I always make it a rule to test response at at least one quarter mile before making any flight, and then rechecking after 4 or 5 flights. 2. Failure to check and replace batteries or to establish a reference voltage for safe operation. Most of this trouble results from using filament batteries too long and a tendency to guess at their probable life. It is recommended that end point figures be determined by operating a receiver on the test bench to establish failure voltages and then stay well above same. 3. Improper flying procedure. This is undoubtedly the most common cause of lost control, especially with a rudder control plane. If there is any perceptible wind, the first and constant aim of the flier should be to keep the model upwind as far as possible and perform all maneuvers in that direction. It usually only requires one or two false movements of the rudder to result in the model being blown far downwind and out of control."

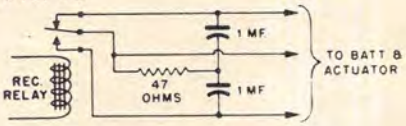
To which we can only say—Amen. Jim's last point might be more in the class of "operator bugs," but it is just as sure a way to lose your plane as any of the equipment bugs we have covered.

FIG. 4A



MOUNT RESISTOR AND CONDENSER RIGHT ON RELAY, IF POSSIBLE

FIG. 4B



McEntee on R/C

(*Continued from page 51*)

was used for all these marks. Undoubtedly the flights were sponsored by the state; while we can't hope for any help from our own governemnt, in an attempt to bring the records to this country, this would seem to be a good project for some of the more active R/C clubs. How about it?

Wayne D. Carpenter (W4JMU/1) 24 Ridge Rd., Quonset Point R. I., would like to contact other ham R/Cers on 40 and 75 meter phone.

Club Doings. Ft. Worth Aeromodelers Assoc. has been organized in that Texas city, with many R/C modelers among the members. Jesse F. Shephard is Pres., Reno Crane is V. P., and R. J. Heist Sec.-Treas. Since Jesse is a hot R/Cer, we can see what the club will be hearing the most of! They held an R/C contest under AMA rules, had 14 flyers who made official flights. Winner was J. W. Jones (Dallas) with much-modified Rudderbug weighing 7 lbs. (!), and with Miller receiver. Harold Bulman (Waco) won a coin toss from Chuck Burtner of same place, to take second. Jesse was Contest Director and gives thanks to E. Simonton, Walt Reeves, Frank Huffman, Tom Lloyd and sponsor Edd Alexander for their help.

New R/C club at Manhattan, Kansas, with headquarters at Betton Music & Hobby shop. Matt Betton says there are eight members with lots of enthusiasm.

The Milwaukee Flying Electrons (2100 E. Webster Pl.) meet once a month, have 30 active members. They fly all types of equipment, including three Rockwood outfits; one of these is owned by Vic Weissbrodt, who writes that another member, M. Inkman, has a 6-channel rig in a 12 lb. Flamingo amphibian. Vic's son, Bill, has a Liberty Belle equipped with Macnabb radio, and Vic says it is more fun to fly than the big reed-equipped ship. Club has run several R/C contests, last one being won by Frank Adams of Janesville, Wis., with an original design, 40" span plane.

Doyle Thompson (Guthrie, Okla.) writes of considerable radio activity in his state. He also tells of a new R/C club in Wichita, of which he is a member. First meeting brought out 16 members, with many more expected to join later. He has the same complaint registered all last spring by most of us—too much wind! Says that Harry Siegfried (son of Charley Siegfried of giant R/C plane fame) has deserted the huge ships and now flies a 22 oz. midget.

A few more notes on the Mac II transmitter: John Worth says that one builder has used the high resistance relay that comes in this outfit (the one with multiple contacts) in a relay pulse box. Some users have found that the 2V. storage cell does

(*Continued on page 61*)

JOIN THE SWING TO R/C

HERE ARE VALUES GALORE

R/C EQUIPMENT

Super Aerotrol 27 mc Crystal Controlled Transmitter, completely assembled with tube and antenna, less batteries	$27.95
In Kit Form (less tube)	19.95
Super Aerotrol Dust Core Tuned Receiver, completely assembled with tube, less batteries	21.95
In Kit Form (less tube)	13.95
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Good Brothers Radio Control for 50-54 mc, complete equipment for single channel control	55.00
E. D. Aristrol "Boomerang" Receiver ready for installation with polarized relay and self-neutralizing escapement	29.50
Less escapement	24.95
E. D. Aristrol Transmitter 27 mc with antenna and keying cable	29.50
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Super Aerotrol Escapement, assembled	3.95
XFG-1 Receiver Tube	3.50
3A5 Transmitter Tube	2.25
O-3 Milliammeter	3.50
O-5 Milliammeter	2.75
Sigma 4F 8000 Ohm Relay, factory set and guaranteed	7.00
E. D. Polarized Relay, fully balanced leaf armature	7.50
Frequency Meter, shows if you are on correct 27.255 mc/s frequency with top output	2.00
E. D. Mark III Escapement, uses 3 pen cells	5.95
Clockwork Escapement, ideal for marine use, 2 or 4 position operation, 3 ozs.	11.50
Bonner Compound Escapement, 4 position, makes one channel duplicate three channel control	14.95

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LONG LIFE . . . Will last up to 10 years with proper care.

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SINCE 1937

R/C COMBO METER

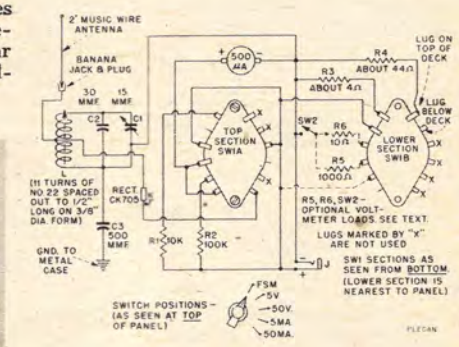
By HOWARD McENTEE W2SI

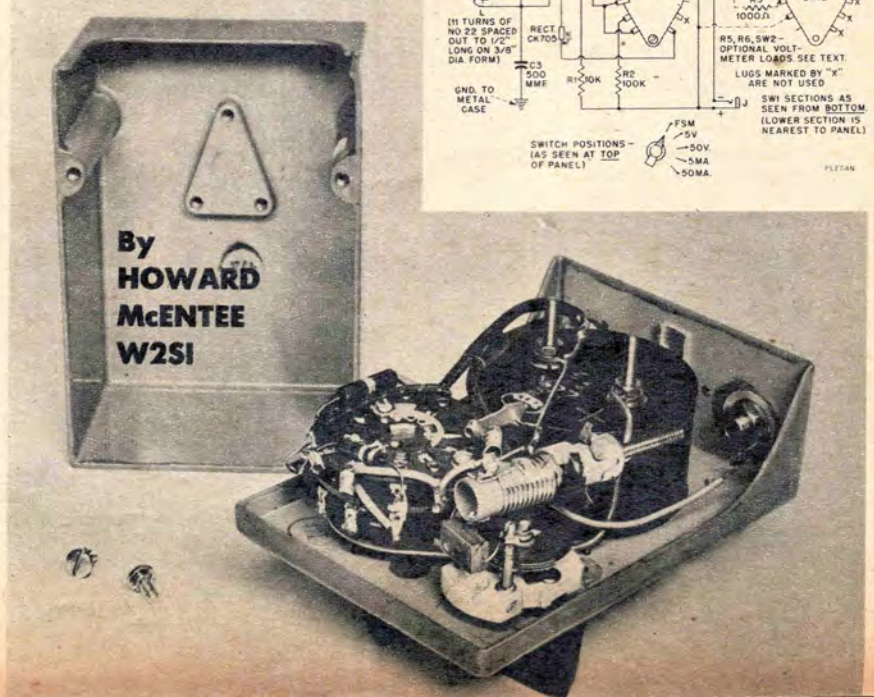
■ The final test of any transmitter is whether it will operate your receiver at the desired distance—and with a good factor of safety. However, such tests require lots of time and long-distance walks; for rapid checks close by there is nothing to beat a Field Strength Meter. This simple instrument can show if your transmitter is loaded properly, if the batteries are still good, how the crystal is behaving, give a rough idea of the power output, and so on. There are two approaches to the construction of a FSM; the simplest is to purchase the most sensitive micro-ammeter you can get, and hook it to a crystal detector and an antenna. Unfortunately, this is also by far the most expensive approach, for meters in the range of 50 or 100 microamperes don't sell for peanuts; furthermore, they are delicate, and should not be carried around for general field use.

To make the FSM shown here, we took the other possible path. A meter of medium cost was employed—to ease the pocketbook strain—and the desired sensitivity was insured by the use of a tuned input circuit. The latter offers an extra advantage, in that the unit serves as a fairly accurate indicator of frequency, too. It is certainly nowhere near what the F.C.C. calls a "Frequency Standard," but it will show if your transmitter is "taking off" in self-excited operation without benefit of crystal.

Since a good meter was to be used, it seemed a shame to keep it strictly for FSM purposes, so a switching circuit and a few resistors allow us two voltage and two milliampere ranges, which just about cover all the needs for transmitter and receiver servicing.

The search for a rugged small case turned up a surplus job that serves very well, and in addition comes with several parts that are needed for the final circuit. All components are fastened to the cover of the box; before it is used, the box should be stripped of parts and wiring. There are a couple of long studs that must be cut down; these are cast as part of the cover. They were sawed as short as possible and the stumps were then chewed off with a hand grinder. Another removal operation must be performed on a rib that is cast inside the cover on the end which holds the two jacks. This sounds like a lot of work, but isn't, since the box is made of cast aluminum, and





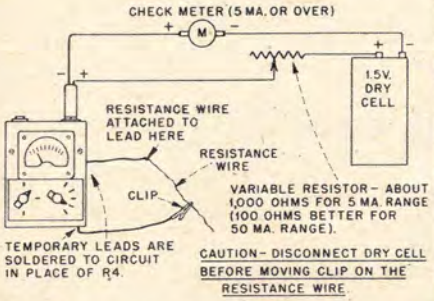
cuts clean and fast. The meter requires a 2 1/16" hole, which may be made by the time-honored method of drilling a circle of holes, and filing them out to the required size. The two original jack holes are filed outward, so that the final position is as shown on the sketch; all holes shown thereon are those needed for this instrument. There are a couple of extra holes that may be plugged up by some such material as Testors Fyll.

The two jacks must be insulated from the case. This may be by fiber or Bakelite washers. The jack that is used for volt and milliampere connections is one of those that came in the BC-366—the one with the large hole. The antenna jack is of the banana type and can be taken from the basket full of 'em that is in the BC-366.

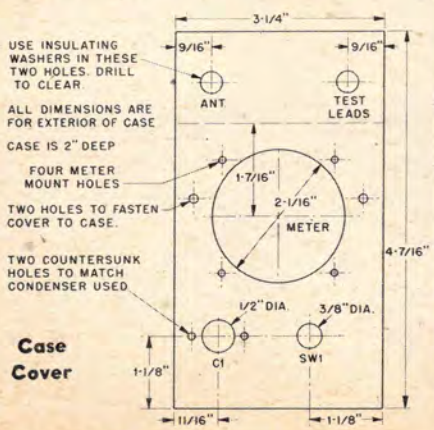
As much wiring as possible on the switch should be done before it is fastened in the cover of the box. This switch needs a bit of modification; disassemble it (mark the two sections, so you can get them back together the original way) and remove the heavy wire spring. Also, with a hand grinder, cut the detent disc so that the last two positions may be reached reliably; there won't be much detent action on them, but the detent disc should center the contacts correctly.

Many of the switch contacts are not used. Follow the sketch carefully in wiring up, and after the job is done, check your work *several* times. This is the sort of job where it is easy to go wrong —and some wrong connections can ruin the meter.

The slug-tuned coil is mounted right on the variable condenser, and if you get the one specified, it will be ready-wound and tapped. You can make your own from the specs on the drawing. We chose the two voltage ranges of 5 and 50 V. as probably the most useful. If you normally use 67½ V. batteries, you might want to extend the meter range to 100 V.; any voltage range may be had, the necessary series resistor being figured by multiplying the desired full scale meter reading by 2000. Thus, for 100 V., you would need 200,000 ohms at (*Continued on page 73*)


CHECK METER (5 MA. OR OVER)
M
1.5V. DRY CELL
RESISTANCE WIRE ATTACHED TO LEAD HERE
RESISTANCE WIRE
CLIP
VARIABLE RESISTOR – ABOUT 1,000 OHMS FOR 5 MA. RANGE (100 OHMS BETTER FOR 50 MA. RANGE).
TEMPORARY LEADS ARE SOLDERED TO CIRCUIT IN PLACE OF R4.
CAUTION – DISCONNECT DRY CELL BEFORE MOVING CLIP ON THE RESISTANCE WIRE.

Calibrating for 5MA. range



IMPORTANT ANNOUNCEMENT FOR R/C HOBBYISTS

The undersigned, former senior partner of Electronic Specialty Supply Co., takes great pleasure in announcing that he is now set up to take and process your orders at the same old stand.

You may be assured that he will continue to supply R/C materials of the highest quality, unbeatable prices and with friendly, cooperative fast service.

Being an old timer in the radio business, a radio ham since 1928, he thoroughly understands your R/C problems. This long varied experience will enable him to put into the R/C hobbyist's hands items of interest at the lowest possible prices.

The special 5 watt transmitters will continue to be available and you will find like many others it is tops in the field. A new line of receivers using the printed circuit process will shortly be available. Our receiver parts packages will continue to be tops in quality and value. Our component parts and tubes of the highest quality.

We look forward to being of service to you. Send for our new free catalog available soon and watch for our ads. All requests for our catalog will receive a free useful item of interest. Yours for reliable economical R/C operation,

Signed: IRV MEGEFF

RADIO-TRONIC SPECIALTIES COMPANY
58 WALKER STREET
NEW YORK 13, N. Y.

SPECIAL THIS MONTH, TYPE OSR QUENCH 5, THE TYPE THAT ALWAYS WORKS. REGULAR PRICE, **$2.07** ..... SPECIAL—**$1.65**

E-Z-JUST *Plastic* **CONTROL HANDLES**

NOW with PRE-FORMED loops!

Quick hook-up and unhook! The cable loops are already formed for you! Adjusts and locks quicker than any other handle, — can't slip. 150-lb. min. test. Hot fuel-resistant. "Standard" 5-inch size for all flying. "Hot Rock" 4-inch size for speed flying.

only 85¢

Look for them in the red-white-and-blue boxes!

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"MINIMOUNT" for engines up to .19 displacement. $1.25

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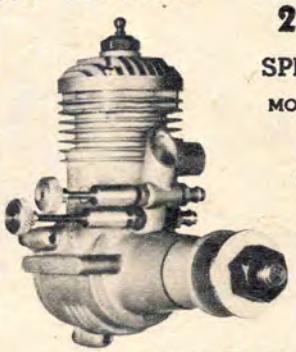
CAMERON

.19 ENGINE

2 SPEED MODEL



Only $11.95

The Cameron .19 L-2 Speed Engine is designed and built especially for use in radio control and other models where a 2 speed engine is desirable. It can be used the same as any conventional single speed engine and also gives the modeler the added advantage of being able to change the engine speed while the model is in flight.

Manufactured by CAMERON PRECISION ENGINEERING CO. Chino, California

RADIO CONTROL FANS! DON'T MISS THE BOAT!

Sterling boat kits are especially engineered and designed for radio control!

Complete installation shown in detail on easy, step-by-step plans!

See these spectacular models in our ads on pages 62 & 63

Sterling models

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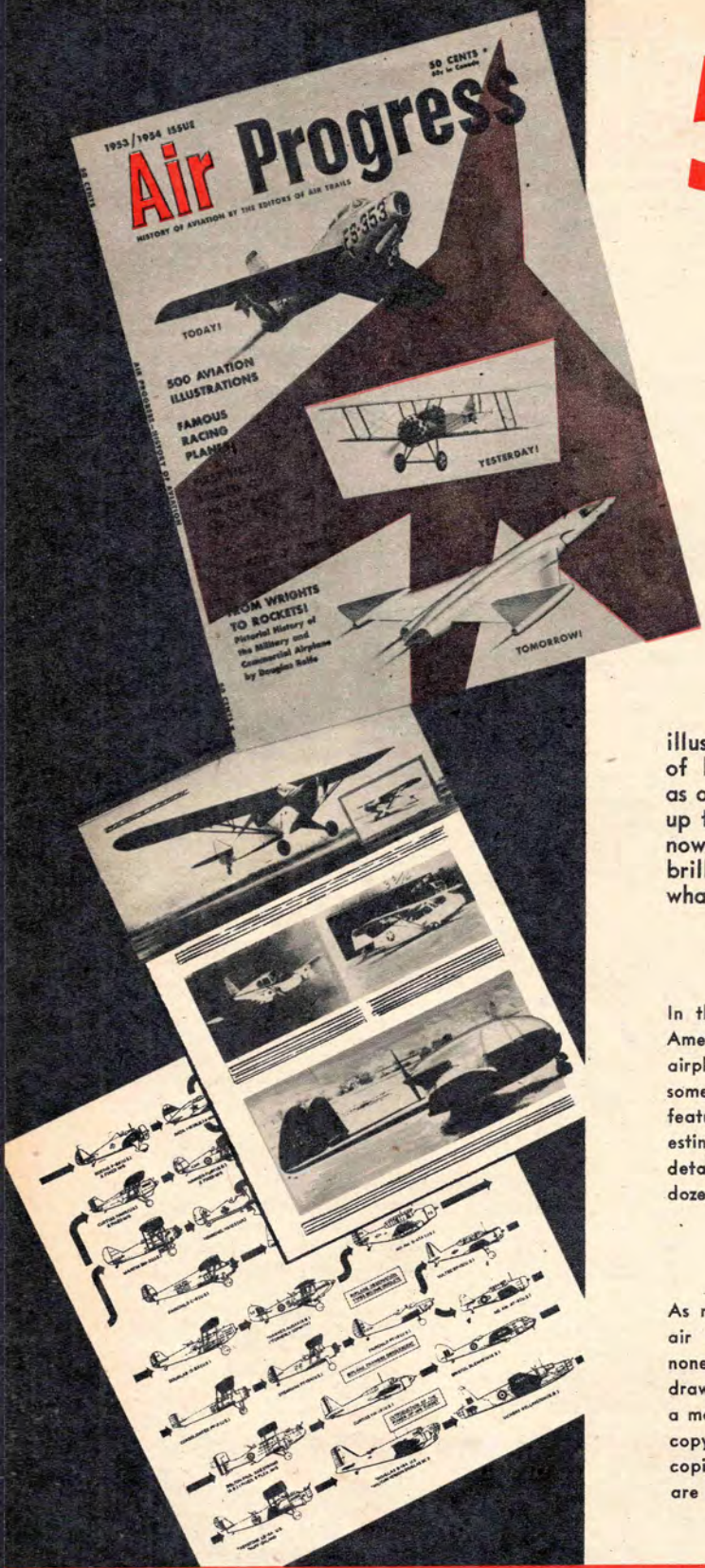

50 years

FIRST HALF-CENTURY OF FLIGHT LAVISHLY ILLUSTRATED, MINUTELY DETAILED IN BRAND NEW 1953/1954 EDITION OF "AIR PROGRESS" ANNUAL

Announcement by Street & Smith Publications of its second annual edition of Air Progress has been met with rousing cheers throughout the aviation world. And for good reason—last year's annual established all kinds of publishing history. Never before had so many aviation illustrations been offered in one volume at such an unheard of low price. Air-interested readers everywhere acclaimed it as outstanding; the big question was: "How can the editors keep up the pace? What's left for them to do next year?" Well, it's now "next year" and you have the opportunity to see just how brilliantly the reputation of Air Progress has been upheld and what a valuable reference medium it has become.

OVER 500 ILLUSTRATIONS

In the 1953/1954 edition special tribute is paid to the magnificent part America's aircraft industry has played in the rapid advancement of the airplane. At the same time the less publicized folk of aviation come in for some splendid coverage. Their efforts get special treatment in big pictorial features along with extended coverage of famous air races, some very interesting but little known military "mystery" planes, and hitherto unrevealed details of the Japanese air force—to mention just a few of the dozens and dozens of valuable, informative, authoritative articles.

GET IT NOW!

As might be expected in this important year which celebrates 50 years of air progress, numerous books and compilations are being released, but none comes anywhere close to offering so many fascinating aviation pictures, drawings, text and sketches by so many noted authors and artists for such a modest sum . . . 50¢. Not only do we advise you to send for your personal copy of Air Progress right now, but we strongly urge you to secure extra copies for your air-minded friends, especially for those young fellows who are heading for a career in aviation.

AIR PROGRESS for 1952

More than 1,000 aviation illustrations—a real "must" for the air fan's library. Same price-by-mail as the 1953/1954 Air Progress.

AIR TRAILS MODEL ANNUAL FOR 1953

Every air-modeler should have a copy. Same price-by-mail as Air Progress. Limited quantities—act now!

AIR TRAILS MODEL ANNUAL FOR 1952

A real collector's item! Lots of valuable charts, data and important modeling facts. Same price-by-mail as Air Progress.

for 50 cents

In U. S. and Possessions, 50c; Canada, 60c; Elsewhere, $1

This year in Air Progress the emphasis is on the airplane from the standpoint of the camera, whereas last year the major effort was by drawings. This does not mean that we're neglecting the talents of such outstanding aviation artists as Douglas Rolfe and Frank Tinsley in this country or the Das Brothers and Roy Cross in Europe, but it does allot more space to the photographer whose camera has recorded the birth of flight and all important planes and aeronautical happenings right up to the guided missile era . . . and, incidentally, you'll find interesting photos of **those** "birds" in flight! The contents of Air Progress is one of those you must see to appreciate . . . but to give you just a glimpse of what will be found between its covers here's a quick run-down on some of the scores of valuable features. Ask anyone who has a previous issue of Air Progress and you'll soon understand why no serious aviation fan, industry worker or future aeronaut can be without a personal copy of Air Progress!

JETS OF THE WORLD

FAMOUS PLANES OF THE JET AGE . . . that's what you'll find in the lead-off section of "A.P."—"Jet Aircraft of the World." More than one hundred photographs of operational and new jet powered planes from all the air nations. Along with these valuable photos are accurate three view drawings of American jets—latest models such as the Boeing Stratofortress B-52, Convair XF-102 and XF2Y-1 Sea Dart, Douglas XA3D-1 and F4D-1 Skyray, Lockheed F-94C Starfire, Republic RF-84F Thunderstreak, North American FJ-2 Fury II, Chance Vought Cutlass F7U-3.

MILITARY MYSTERY PLANES

MYSTERY PLANES OF THE AIR FORCE, ARMY AND NAVY . . . here are lesser known prototypes of which the public heard little . . . aircraft that were particularly significant but little publicized usually because of security reasons. Here are the "missing" pursuits, bombers, observation ships. Here, in photo and data form are such aircraft as the Vultee P-66, Curtiss XP-62, Republic P-47H, Lockheed XP-58, Vultee XP-54, Northrop XP-56, Grumman XP-50, Curtiss XP-55, Curtiss YP-60E, Douglas P-70, McDonnell XP-67, Republic XP-72, Bell XP-77, Fisher XP-75, Bell XP-83, Seversky XP-41, Curtiss XP-42—and dozens and dozens more.

HIGHLIGHTS OF HISTORY

AUTHENTIC AVIATION HISTORY—recreated in written and photographic form; reenactments of the two most famous events in the air era: "First Flight by Man"—photographs of the Montgolfier Balloon, recreated in exact likeness of the 1783 craft, being prepared for flight and the first ascension of a human being in free flight! "He saw the Wrights Fly," a never-to-be-forgotten account of how a young lad met the Wright Brothers at Kitty Hawk, helped them prepare their original plane for flight and then was one of the fortunate few to witness the first powered flight by man!

SPECIAL CUTAWAY DRAWINGS

MINUTELY DETAILED CUTAWAY DRAWINGS . . . last year in Air Progress famous history-making planes were presented in authentic cutaway drawing form (the Wright plane, Bleriot, Spirit of St. Louis, etc.); this edition of Air Progress brings you right up to the minute with the unequalled detailed, skeletonized drawings by the world-famous Rudolf Das of the American Convairliner 340, the Fokker Mach Trainer (Holland's S-14), Britain's Vickers Supermarine Swift (Type 541)—and as a special highlight: the "inside" story in cutaway form of the Allison J-35 Turbojet engine!

AIR RACING SECTION

Do you know the exciting history of America's big air races where over-powered planes flew for glory and fat purses? In a special section Air Progress recreates the great Bendix and Thompson races, gives you the behind-the-scenes story together with pictures of winning pilots and planes. The Bendix cross-country classic is detailed from Doolittle's 1931 win in a Laird Super Solution (at an average speed of 223.058 mph) right through to the end when Joe DeBona's F-51 racked up an average speed of 470.136 miles per hour in 1949. You'll follow the development of the Thompson race from 1930 to 1949, from Speed Holman to Cook Cleland, from Speed's 201.9 mph to Cleland's lap record of 408 mph!

FIGHTERS—THEN AND NOW

For the first time an invaluable photographic comparison of a World War I Thomas Morse S-4C Scout and a contemporary Republic F-84F Thunderstreak. Similar flight shots and ground pictures show the vast changes that have been made in aerial attackers. You get all the details from the C-9 90 hp rotary LeRhone engine to the Wright 7,200 pound static thrust J-65 Sapphire power plant. A real "must" for every air fan!

ONE-OF-A-KIND AIRCRAFT

What do you know about the Crouch-Bolas or the Cairns Model A? Or the Hammond Y? Scores of little-known aircraft are covered in this amazing round-up. Here are just a few: Brown Young, Uppercu-Burnelli UB-20, Herrick HV-2A (a very important plane in the light of today's developments), Beco B-5, Lambert 1344, Stewart M-2, Continental GR-1, American Gyro Crusader AG-4A, and the Gwinn Aircar. Plus more, more, more.

THE BIGGEST, THE BEST "BUY" IN AVIATION PUBLISHING!

We've given you only a glimpse of the contents of the new Air Progress. We scarcely mentioned "Secrets of the Jap Air Force!" Or the "Saga of the Curtiss Hawks" (what do YOU know about the P-1, the AT-5, the F6C-3, the XP-3A, XF11C-1, etc., etc.—those and many more are shown in photo form). And then who could fail to thrill to Frank Tinsley's "Famous Firsts in Aviation" with text and drawings by the old master himself?

ORDER YOUR COPY NOW

Air Progress will go on sale late in August on newsstands and in hobby shops all over the country . . . but you can insure yourself of getting a copy as soon as it's off the press by sending along the coupon order form RIGHT NOW! Why hold off? This is one of those buys-of-a-lifetime—so send that order form, be the first in your neighborhood to have a copy. Mail the coupon today.

Do you have these other valuable editions in your library? Why not order a complete set while copies are still available? And for the best gift of all—to your airminded friends as well as yourself—don't overlook a subscription to Air Trails, the monthly magazine of Air Progress and Aeromodeling!

AIR TRAILS — the leading monthly magazine of air progress and aeromodeling. $3.50 a year in U. S. and Possessions; $4 in Canada; $7 to countries of the Pan American Union; $10 elsewhere.

SEPTEMBER, 1953

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Monofoil Wings
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R1 Hot-Shot, 70c

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Fully shaped bodies, metal axles and rubber wheels. Racers and hydroplane speed boat can be powered with standard CO2 jet cartridge.

60c to $1 **Jet Racers**

Fighting Ships

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B1 Landing Ship, $1.25

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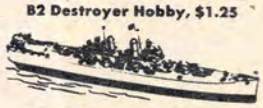
Carved, smooth 16 inch hulls, super-detailed parts, flags, decals. Detailed plans. Authentic and realistic.



B3 Cruiser Chicago, $1.25

B4 Battleship Missouri, $1.25

Monogram Models, Inc. 3421 West 48th Place • Chicago 32 { MODEL AIRPLANES • SHIPS JET POWER RACERS

(*Continued from page* 55)
not give very good results if simply filled with electrolyte and put right to use. If given a full charge after it has been filled, results are fine, though. Irv Megeff suggests the use of the low resistance relay that comes in the PE-157—the one with single very heavy contacts—to turn on the vibrator supply. Relay coil is connected in series with 3D6 filaments, which eliminates need for the 1 ohm resistor. Relay coil is connected to storage cell through small toggle switch, to control the rig. The two coils of the relay should be connected in parallel; if they don't work one way, reverse leads to *one* of the coils.

Want a smooth and flat workbench at low cost? Walt Good found it possible to obtain flush-type door seconds at many lumber yards; seems they are seconds because one side has been damaged, but the other side is the one you use. Put the door up on a couple of horses, or attach X-type legs, and you have a first-class table.

A good reversing switch for R/C purposes (it would work fine in the "A.T." TV truck, for example, in place of the escapement and multiple contacts) may be made from an American Flyer reverse relay, obtainable from many A.F. repair shops. Rewind coil to lower voltage; if full of #28 wire, it will work on 4½V. or even a bit lower, and takes about 900 ma. Gives current forward, reverse and two off positions in sequence.

Commercial Notes. With the rapid growth of R/C, many concerns are putting out parts kits for equipment we have described in Air Trails. Much as we would like to, it is impossible for us to check all such kits, so it should be understood that they are not approved by us—nor disapproved, for that matter. Incidentally, we would appreciate it if readers will tell advertisers that they saw items in this magazine, when writing or ordering.

New kit plane especially designed for R/C use has been announced by Ray Morgan (Ray's Hobby Shop, Patterson Calif.). Called the "Flying Ohm," it is well prefabbed, will sell for $7.95. This is a 4 ft. cabin design.

A two-position self-neutralizing combination relay-escapement will be sold for $8.95 by Electronic Specialty Supply Co. (58 Walker St. N.Y. 13). Coil is 10,000 ohms. Unit is called Ace-Scapement, has ball-bearing washer to take rubber pull. Same concern has converted G.E. relay weighing 2.1 oz. and recommended for hard tube receivers, or others that can run at 2 ma. or over. Contacts are SPST and price $2.45. Essco will exchange one new 3D6 tube for each high resistance relay from P.E.-157; a chance to get something useful for a gadget most Mac II builders will never use.

Control Research (Box 9, Hampton, Va.) has plenty of ⅛" thick alnico disc magnets with center hole, ¾" diameter, two for 65c. Same diameter, but ¼" thick, sells for 65c apiece. Supply of latter size limited.

Contest Managers might be interested to learn that Jack Russell (Russell Bros., 312 K.P. Bldg., Des Moines, Iowa) has among the many trophies he sells, several especially designed R/C awards. They show modeler with transmitter and antenna. Others have a plane on the award, too.

Test Pilots' Pilot

(*Continued from page* 21)

had better not be the main attraction in it. The same goes for any publicity likely to result.

Martin doesn't mind a little fear in a man—if it's just enough to make him respectful of what he is doing. But if the man questions his own ability to do a job, he's not for it.

Whether it's wholesome respect or lack of confidence, the man betrays in a number of ways readable to Martin. He drinks too much. He makes excuses. He keeps wanting changes in the ship.

If necessary, Martin will take the ship up himself.

And knowing his airplanes as he knows his men, he is less troubled by doubts about any of them after they reach the flying stage than he was about that old Jenny long ago.

F4F-4 Wildcat

(*Continued from page* 31)

connect the control rod to the horn. Check control system to be sure it does not bind.

Complete building details are available on the full-size plans.

Bill of Materials

1 ¼"x3"x36" med. balsa, keel, empennage, spar. 1¼"x3"x36" med. balsa, keel empennage, spar. 1 ⅛"x4"x10" plywood, spar joiner, bulkhd. landing gear supports and platform. 24 3/32"x¼"x36" med. balsa, fuselage planking. 4 3/32"x3"x36" med. balsa, wing covering. 1 ⅛"x2"x36" hard balsa, wing ribs, fuselage formers. 1 1/16" dia. 36" lg. music wire, landing gear struts, control rod. 2 ½"x⅝"x4" soft balsa, wingtop (laminate ¼" sheet). 1 .020" dia. 36" lg. music wire, lead-out lines.

Miscellaneous: thread, 4 oz. light grey dope, 4 oz. med. blue dope, one ounce green dope, cement, 4 oz. Testor Sanding Sealer, pins, sandpaper, rubbing compound. .005" plastic sheet, plastic tubing, red, white, blue and black Trim-Film, K&B metal mounts, nuts, bolts, scrap hardwood, tin can, Scientific pilot, 1-¾" wheels.

OK! Let's Get Going

With Monogram SUPERKITS 89c

T2 Corsair, 89c

Solid Balsa and Plastic Scale Models

Carved Bodies and Airfoiled Wings

T1 Mustang, 89c

T3 Thunderjet, 89c

16 to 23 Detailed Plastic Parts in Each Kit

Superkit Parts including Plastic Display Stand

Back Again By Popular Demand! $4.95

EXACT SCALE Control Line Flyers

C3 Piper Cub, $4.95

Note prefabricated balsa fuselage and completely airfoiled balsa patented Monofoil wing.

C4 Aeronca, $4.95

Wing Span 35 inches. For engines .14 to .35 cu. In.

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NEW!

2 EASY-TO-BUILD

Perfectly Scaled! Authentic

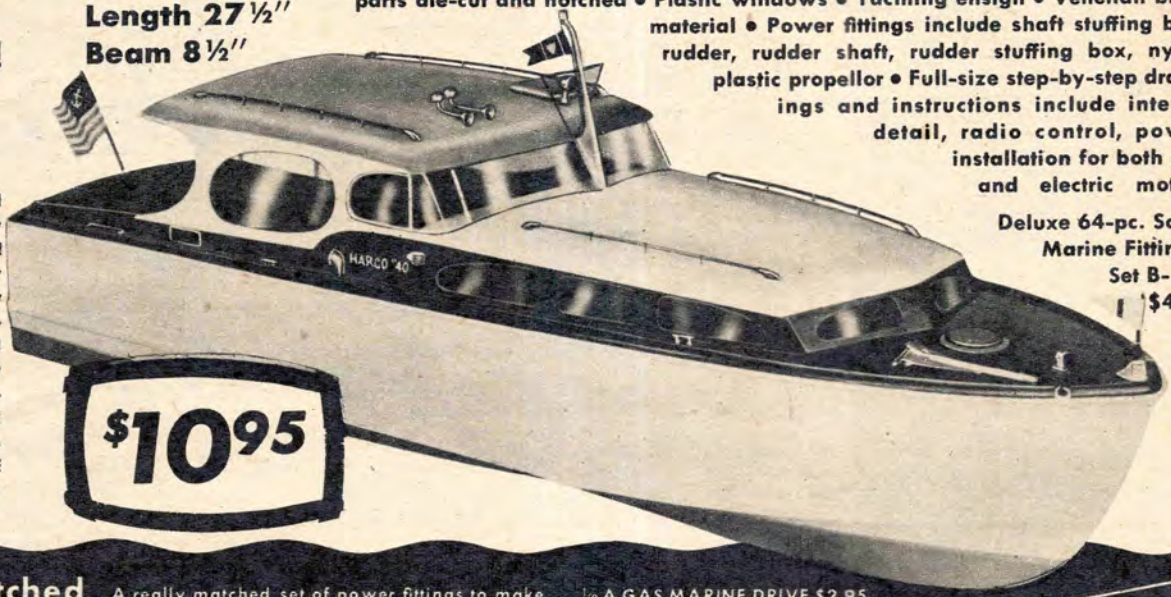
HARCO '40' DELUXE CABIN CRUISER

Kit B-10M
Length 27½"
Beam 8½"

Power Boating • Radio Control • Shelf Model • Mahogany used extensively • All parts die-cut and notched • Plastic windows • Yachting ensign • Venetian blind material • Power fittings include shaft stuffing box, rudder, rudder shaft, rudder stuffing box, nylon plastic propellor • Full-size step-by-step drawings and instructions include interior detail, radio control, power installation for both gas and electric motors

MAGNIFICENT REPRODUCTIONS! BRILLIANTLY ENGINEERED!

Fabulous! That's what you'll say when these great new boat kits just fall together! Perfectly scaled from factory drawings. Parts are accurately die-cut and shaped . . . internotched for easy and rugged construction. Made of finest mahogany and balsa. Fascinating to build—and a real thrill to watch in action, in water! BRAND-NEW! SEE THEM AT YOUR DEALER'S TODAY!



$10.95

Deluxe 64-pc. Scale Marine Fittings. Set B-10F $4.50

Here at last! Matched MARINE FITTINGS

A really matched set of power fittings to make up the finest marine drive unit ever offered! Every part engineered for maximum performance! Gas marine drives include brass fly wheels. Sensational new nylon 2-bladed propellor. All marine drives available in complete sets or separate units.

½A GAS MARINE DRIVE $2.95
Includes universal, fly wheel, rudder, shaft, stuffing box, rudder post, rudder stuffing box, nylon propellor.

Western

(*Continued from page* 36)

different guys win the watches this time. Dick Sladek failed to place in the top three in either event. Tom Henebry who won Half-A was the subject of some good-natured kidding. Seems like Tom had given his last year's ship to his son when he built his new one. At the Aeromodelers contest he lost his new ship, so he had to "borrow" the old one from his oldest son. He totaled over 17 minutes to far outstrip Ernie Wrisely who was second. In A-B, Ray Van De Walker came through for the first time, very closely pressed by George Wagner and Ed Rominger in that order.

The Jr.-Sr. events were lacking for contestants. One sad note was Dave Zeller's out of sight flight on a 2-second over-run with his Brigadier. The dethermalizer didn't work. In Half-A Nat Antonioli was first and the only contestant to get off.

The next contest was the Twin Cities Annual. Jose Tellez and I drove all Friday night in order to get there for the Saturday events. What a day, what a field! Several fellows were down from Medford, notably Lloyd Miles, that amazing junior who won a second at the Nats the day before he was hospitalized with lockjaw—suffered from an accident prior to the meet. Bob Ottoman made a rare appearance with his Flattops and also did some swell flying.

Top man for flying was Joe Bilgri who won two firsts in Payload to make up for the time lost on crutches last year. Joe also won a first in Wakefield, flying his 3rd and 4th best ships. Jack Jella took two firsts and a second, using slightly modified Zeeks. Fast climb, amazing recovery. Real good ships in the wind. Robert White who, like Jella, is from Salinas, was also using the same type ship. The only event these combinations didn't win was Class A!

Radio control gave us our first opportunity to observe the Rockwood gang in action. From the few flights we watched, it was quite obvious just why some fellows

MASTERPIECES by Sterling models

in every detail!

1530-34 N. Hancock St. Philadelphia 22, Pa.

HIGGINS 26' EXPRESS CRUISER

Kit B-9 • Length 15" • Beam 5¼"

$3.95

• Mahogany used extensively—for cabin sides, windshields, bulkheads, instrument panels • Scale marine fittings from bow light to exhaust • Power drive unit including rubber universal, shaft, stuffing box, propellor, rudder • Authentic decals, yachting ensign • Full-size detailed step-by-step plans and instructions

SEE THESE OTHER STERLING MODELS

Planes	Kit	Price
Monocoupe	C-1	$4.95
Howard Pete	C-2	5.95
Mr. Mulligan	C-3	4.95
Waco	C-4	5.95
Polish Fighter	C-5	5.95
SE 5	C-6	5.95
Ryan S-T	C-7	5.95
Fokker D-VII	C-8	5.95
Ring Master	S-1	2.95
F-51 Mustang	S-2	2.95
Yak-9	S-3	2.95
Space Master Junior	S-4	2.25

Power Boats	Kit	Price
Richardson 27' Cruiser	B-1	5.95
Higgins 17' Speedster	B-2	4.95
Chris-Craft 47' Buccaneer	B-3	7.95
Century 20' Resorter	B-4	3.25
Century 20' Sea Maid	B-5	2.95
Chris-Craft 32' Cruiser	B-6M	9.95
Chris-Craft 50' Catalina	B-7M	11.95
Century Sea Maid '20'	B-8M	7.95

A or BC GAS MARINE DRIVE $3.95. Includes universal, fly wheel, rudder, shaft, stuffing box, rudder post, rudder stuffing box, nylon propellor.

ELECTRIC MARINE DRIVE $2.25. Includes universal, rudders, shaft, stuffing box, rudder post, rudder stuffing box, nylon propellor, shaft nut.

INDIVIDUAL FITTINGS	
½A Universal	$.85
½A Fly wheel	.85
½A Shaft & Stuf. Box	.25
A or BC Universal	1.25
A or BC Fly wheel	1.25
A or BC Shaft & Stuffing box	.35
Nylon propellor 1⅜" dia. x 1⅜" pitch	.75

Scale Marine Fitting Sets

Set B-6F 3.50 — Delúxe 34 pc. set for Kit B-6M

Set B-7F 7.95 — Deluxe 66 pc. set for Kit B-6M

Set B-8F 3.95 — Deluxe 34 pc. set for Kit B-8M

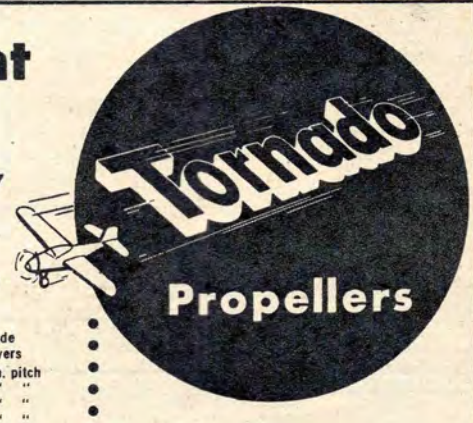
want to split the event into two classes. We watched some fine flights by Ray Regalia, he really puts on a show. Ray checks out his ship with engine running, leaves an assistant to hold the ship; at his signal, his helper lets it go, it doesn't move, all of a sudden he guns the engine and takes off. Under the gusty conditions at Yuba City, this take-off required some hair-trigger action, but Ray proved the master of the situation, hitting the right control, finally giving up elevator and powering the ship off the ground. What flying—by far the best we had ever seen, and the part which amazed us even more—no trouble. This led to a very close observation of his ship. There was the reason. A very neatly constructed ship. The rig—nothing "haywired"—a very practical application of a good unit. Everything was designed to have its place and do a job, and that is just what it did.

We have left the flying scale for last since we just do not go along with the rules. John Tatone had a Half-A scale job there, the finish and workmanship being as good as the U-control he flew at the Nats. Scale points? He made far more than anyone. Fly? Of course it did. Win? Well, no, there is too darn much emphasis on flying. With the rules the way they are, one could build a good scale fuse, put a polyhedral wing and lifting tail on it, still get some points, then fly the pants off anything entered and thereby win the contest. John didn't have a chance, even with the only scale model that might compare with Bill Krecek's "Stosser." What chance did he have even with high scale points when ratios over 2 to 4:1 were obtained by other contestants? Most fellows don't like these rules and they certainly would never have been approved on a ballot. Do we still have a contest board and aren't they allowed to make the changes the fellows want? Apparently so, but it seems they must be posted by November 30, to be official.

The next contests we attended and next ones held were the eliminations. High times were made at Sacramento. Pop Rob-

(*Continued on page 65*)

for consistent HIGH QUALITY



Radio Control Propeller

(recommendations)

Engines	First Flights and Low Altitude	High Altitude and Maneuvers
All .049's	7 in. dia. 2 in. pitch	7 in. dia. 3 in. pitch
Cub .074	8 " " 3 " "	8 " " 3 " "
.09's	10 " " 2 " "	9 " " 3 " "
.14's and .15's	10 " " 3 " "	10 " " 4 " "
McCoy .19	11 " " 3 " "	10 " " 4 " "
Cameron .19	11 " " 3 " "	11 " " 4 " "
K&B .19	12 " " 3 " "	11 " " 4 " "
Fox .19	12 " " 3 " "	11 " " 4 " "
K&B .29	12 " " 3 " "	12 " " 4 " "
Fox .29	12 " " 3 " "	12 " " 4 " "
McCoy .29	12 " " 3 " "	12 " " 4 " "

R. C. Propellers

10 in. dia. 2-3-4 in. pitch—35c ea.
11 and 12 in. dia. 3-4-5-6 in. pitch—45c ea.

Plasticote Propellers

5" and 6 in. dia.—15c ea. **7 in. dia.—20c ea.**
8 and 9 in. dia.—25c ea. **10 in. dia.—30c ea.**

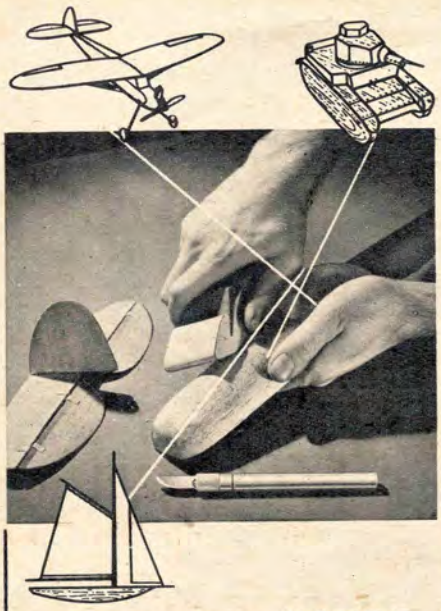
For the STUNT FLYER

The new 10" dia. Plasticote Propellers are now available at 30c ea. in 5 and 6 in. pitch. On all the .29's use a 10-5, on the .32 and .35 a 10-6. Forster 29 and 31, McCoy 29, do very well on the 10-5. The efficiency of the Plasticote propellers run up to 95%, and it may be advantageous to try a 10-5 instead of a 10-6.

RADIO CONTROL NOTES

When flying R. C. it is necessary to reduce venturi opening from 25 to 50% on almost all engines. Large props slow your engine R.P.M., reducing suction. The model does not fly level at all times . . . dives and stalls are encountered changing the fuel force. Plug the venturi opening to such an extent that you get the power you want from your engine. Too much speed in R.C. can be disastrous.

GRISH BROS.
St. John 1, Indiana



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You Ask "AT" answers

Flaps for Control Line Stunt . . . I was thinking of putting flaps on my Messerschmitt 109. I have never tried anything like this before and I'd like to know the advantages of a plane with flaps. These flaps would work automatically off the elevator, and if the elevators are up, would the wing flaps be up or down? My wingspan is about 35 inches; "B" powered. The flaps would cover only a portion of the wing.

Bill Bradl, Buffalo, N. Y.

● Flaps are used on control-line stunt models to tighten the looping radius and make the model react quickly to control action. Like most other factors in model design, there are two schools of thought on the desirability of flaps. Some maintain they are a definite aid, while others claim that a light enough wing loading does the job with no need for flaps.

Flaps on stunt models work opposite to the elevator action: that is, flaps down, elevator up, etc. Flaps should only move about one-third of the angular travel of the elevators. Air Trails Model Annual for 1952 had pertinent information on page 16.

Flaps may be desirable for stunt models, but we would not advise them for a scale job such as an Me 109 (unless you are building a lightweight stunt version). Most scale jobs usually come out a little on the heavy side, so any extra drag such as flaps will harm the performance rather than help.

Electric Engine for C/L . . . I have purchased a British SE-5. I have also purchased a small electric motor (called Mighty Midget). I planned to install this in the plane but thought you could help me by telling me how I could accomplish this. The manufacturer said that the motor has the necessary rpm, but they didn't send any instructions. Could you tell me the "specs" on the real SE-5?

Wade S. MacConnell, Northport, N. Y.

● Since you do not mention the size or kind of kit of the model, we don't know whether this information will be of much help. Models with electric power have been flown control line successfully. However, performance cannot be compared to gas powered ships. The models must be super-light because the motor weight is high. Batteries cannot be carried in the model because of their excess weight. The control lines must carry the current from batteries held by the operator (to the model). Very short lines (10 ft.) or pylon mounted with 3 ft. arm can be flown using these methods.

Simple fact is, the small electric motor does not deliver enough power for its weight and its suitability for model airplane flying is not very good. Your best bet would be any of the glow-plug gas engines available, size depending upon model size.

Specs on real S.E.5A: span 26′ 9″, length 20′ 10½″, Hispano Suiza 220 hp engine, top speed 115 mph, one Lewis and one Vickers machine gun.

R/C Diagram . . . Can I obtain from you the diagram covering a more complex and flexible transmitter and receiver for a radio remote control unit? One that uses the full 5 watts input allowed on the R/C band. I would like a diagram of a reed or tone circuit that would allow a multiple of controls (about 5).

A. S. Cooke, Brooklyn, N. Y.

● We refer you to the book entitled "Model Control by Radio" which contains data and circuits you desire. It may be obtained from Radcraft Publications, 25 West Broadway, New York 7, N. Y., for one dollar.

Two-speed Operation . . . Recently someone told me that some radio control model engines' needle valve can be adjusted in air. Is this true?

Larry Schilling, Ferguson, Mo.

● Yes, you can use two needle valves to get two-speed operation. For details see "Motor of Month" article on K&B 2-speed engine in March 1953 "AT."

Finish Problem . . . I have used a dope-talc mix for a filler. After several coats of lacquer on top of this, the filler cracks and off comes my beautiful finish. What am I doing wrong?

Edwin O. Ross, Maywood, Ill.

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Be "out in front" with this clever ACE Army Jeep—it's a honey! You'll want an ACE Civilian Jeep kit, too! With simplified parts, mostly ready-shaped, and easy-to-follow plans, anyone can put these kits together. The price is only 60c per kit.

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Dept. 9-A
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• Be sure that you use same type of dopes all the way through a finish job. Clear dope mixed with talc should be same type as used for final finish. Mix about one part talc to two parts clear dope, add some thinner for easy brushing consistency. Some different types of dopes, lacquers, enamels do not cover each other properly. If you wish to experiment you can find which combinations work together. Best rule to follow: Use same dope types throughout finishing.

Unleaded Gas for Jets . . . Being relatively new in the field of jet engines, I would like to ask a few questions. First of all, mostly all the jet engines call for unleaded fuel (gasoline). I have tried unsuccessfully to obtain unleaded gasoline. Can you tell me where I might obtain this? And, secondly, why cannot the regular, leaded gasoline be used?

Joe Bogden, Camden, N. J.

• In the East Amoco High Test is about the only unleaded gasoline still available. Some small boat service facilities may carry other unleaded gas brands, since this type is used in outboard motors.

Leaded gas has a corrosive action on jet inside parts and forms undesirable deposits.

Dyna-Jet instructions state that "regular" grade gasoline should be used if unleaded gas is not available; never use high test leaded, because of high ethyl content.

NEXT ISSUE—OCTOBER!
Jim Saftig's new combat-stunt design "X-PENDABLE"

Scale C/L of MiG . . . I would like to build a flying model of the MiG 19, which I believe would make a good looking scale job despite the fact that it would have a gas engine in its nose. Never before having attempted to build a model from a three-view sketch, I have a few problems. The first and all important one, would it "fly"? Second, where would the center of gravity best be located? Lastly, how large would I have to scale it up to run on engines of from .19 to .29, that is, 1"=1'? ½"=1'? etc? Would appreciate any hints on construction.

Felix Zubrzycki, Boston, Mass.

• Scale control-line models of swept-wing fighters are flying successfully. There is no problem if they are balanced properly. Locate C.G. at 25% of mean chord with bell-crank pivot slightly behind C.G. position. Line guide at wing tip will have to extend ahead of wing leading edge. Scale of 1"=1' would be O.K. for .19 to .29 engines, giving a span of 33". Keep construction light so that weight would be about 1½-2 lbs. Hollowed block, or former and planking fuselage could be used. Make wings of "Fireball" type with 1/16" skin and ⅛" ribs spaced about 2½" apart. Tails can be ⅛" sheet or thicker if desired. Use medium stock for thicker sections. Don't be afraid to add lead weight to get proper balance.

(*Continued from page 63*)

bers often gets enthused, but never so much as at this meet. Pop said he has never seen anything like it. It was stormy, windy and cold and he doubted if anyone would want to fly, but he gave them a chance, told them he was ready whenever they were—so up stepped the guys and started yelling for time. The two Joes—Bilgri and Foster—promptly posted two fives and got out their FAI jobs and qualified in both. Altogether five in Wakefield and five in FAI gas made the three-minute average.

At Los Angeles the rain and mist took a horrible toll. Some stayed home, some crashed water-logged ships, ships went out in 4 minutes, other water-logged ships failed to qualify. Dick Baxter was tops in Wakefield while George "Cackleberry" Cassellberry flew his "Q-T Pie" to first in FAI when Bill Trumble went into the clouds on his second flight. In Tucson Vern Walters averaged almost four minutes. At Santa Barbara Glenn Miller was top man when three other guys qualified. San Diego didn't field the 15 required, nobody posted the 3-minute average—so nobody qualified.

The next and last contest was the High-Tailers ROW at Puddingstone, right in our backyard. We arrived a little late so the action was fast and furious when we did

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32" span, Free Flight .030 to .099 engines **$1.95**

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23⅛" wingspan for .099 to .16 engines
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FEATURES:
- beautiful large formed plastic canopy
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Helicopters for Industry Inc., 111 Cathedral Avenue, Hempstead, N. Y.

SENSATIONAL **NEW**

the **WILDCAT**
37" SPAN

$4.45

FLAPS

20 oz.

330" AREA

ENGINE SIZES .19 - .35 CU. IN. DISP.

Every effort has been made to develop the utmost in simplicity of construction, lightness of weight and greatness of performance in this **NEW WILDCAT.** Designed around the famous HJ03515 air foil plus the best basic stunt features possible, it has new low drag wing tips, profile drag cut to a minimum, low wing loading (.06 oz. per sq. in.). The ship you've always wanted.

Designed by **HI JOHNSON**

the **BOBCAT**
37" SPAN

$3.95

19 oz.

ENGINE SIZES .19 - .35 CU. IN. DISP.

324" AREA

Like the **WILDCAT** the **BOBCAT** is a great airplane carefully designed to give the utmost in ease of control. An excellent ship for stunt training, stable enough for the beginner, yet will fly the full stunt pattern with ease. The **BOBCAT** embodies many pleasing features such as simple **KWIK-LOK** construction, diecut parts by the new **KENHI PROCESS,** notched leading and trailing edges, complete hardware, AAA grade wood, diecut windshield, formed gear, **FULL SIZED** plans and many other special features you just can't pass by. You'll fly a **BOBCAT** eventually, why not now.

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get there. First flight we noticed was an ROG type climb so fast that we were really curious. It was none other than F. Swaney with the new big "Southern California Flattop"—"Spacer" to you guys who don't know. Boy, what a climb and glide. It was the talk of the contest.

Swaney won the contest and that Spencer is H-O-T. Taibi has done it again. If others are as good—it is even better than the Half-A which is winning its share of the contests.

—DICK EVERETT

Wonderwings

(*Continued from page 53*)

here and there, so only the high spots will be treated here. Top wing is built over plans, pinning down leading edge, rear spar, and trailing edge. Then add ribs, front spar, leading edge covering and rib cap strips. Join with plywood spar joiners, block in center section and cover bottom with 1/32" plywood. Covering can be silk or Nylon. Silk was used on original. Plans show spar joiners with 7° dihedral angle for top wing. Lower wing has 4° dihedral, and on basis of much flying it is felt that top wing dihedral could be reduced to 4° with no ill effects. So, if you feel you can handle flatter dihedral use 4° in both wings. If you want to be real sure use 7° in top wing.

Complete building details are available on the full-size plans.

Bill of Materials

2 1/16"x6"x36", stab, wing skins. 4 1/16" x3"x36", wing ribs, leading edge, fuselage bottom. 3 3/32"x3"x36", fuselage sides. 2 1/8"x3"x36", ribs and formers. 4 1/8"x1/8"x36", longerons. 2 1/8"x3/8"x36", spars. 2 1/8"x1/2"x 36", spars. 4 3/32"x1/4"x36", stringers. 2 1/2"x 1/2"x36", leading edge. 2 1/4"x3/4"x36", trailing edge. 1 1/8"x5/8"x36", trailing edge. 1 1/2"x 3/4"x36", leading edge. 1 3/16"x3"x12", fin and rudder. Scrap 1/2" and 1" block cowl and wing tips. 1 6"x12"—1/8" plywood, form-

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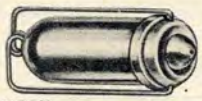
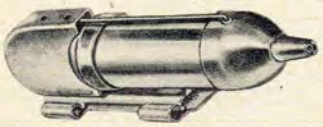
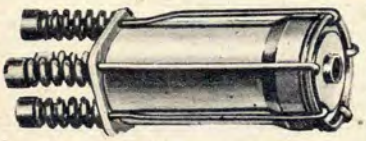


JETEX "50"



JETEX "150"



JETEX "350"

American Telasco, Ltd., Huntington, N. Y.

SPECIFICATIONS	jetex jet engines		
model	50	150	350
ENGINE WEIGHT	.2 OZ.	.73 OZ.	2.5 OZ.
FUEL WEIGHT (min.)	.2 OZ.	.27 OZ.	.4 OZ.
TOTAL WEIGHT	.4 OZ.	1.00 OZ.	2.9 OZ.
① THRUST (max.)	.6 OZ.	1.75 OZ.	4.0 OZ.
DURATION—one charge	12 SEC.	18 SEC.	12 SEC.
DURATION—two charges	—	—	24 SEC.
DURATION three charges	—	—	36 SEC.
TORQUE	NONE	NONE	NONE
EXHAUST VELOCITY	1200 FS	1400 FS	1400 FS
OVERALL LENGTH	1 5/8"	3 1/2"	3 3/4"
MAXIMUM DIAMETER	11/16"	1"	1 3/8"
EFF. WINGSPAN	12-20"	18-36"	32-54"
② ENGINE PRICE	$1.95	$4.95	$8.95
③ FUEL PRICE	$ .65	$ .95	$1.00

NOTE 1 THRUST OF "150" WITH AUGMENTER TUBE: 2.25 OZ.
NOTE 2 INCLUDES: ENGINE, ACCESSORIES, MOUNTING CLIP INSTRUCTIONS, FUEL
NOTE 3 INCLUDES: 10 FUEL CHARGES, IGNITERS, RETAINER SCREEN, SEALING WASHERS

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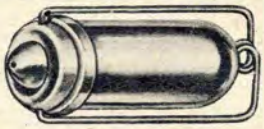

This supersonic power plant is the world's smallest jet engine and the most powerful engine of its size. Its amazing power results from an engine exhaust velocity of 800 mph. It runs on solid fuel, starts every time; is completely reliable and safe. Has no moving parts to break or wear out. Ideal for model airplanes, boats and cars. Sold with 6 fuel pellets and accessories: (extra fuel—10 pellets: 65c $1.95

JETEX #50 FLYING JET MODELS

McDonnell F88A "Voodoo"

Scale flying model of US Air Force's powerful new jet. Features all balsa AEROFORMED* construction for fast, strong assembly. $1.25

P-13 The first practical Delta Wing kit. All balsa, die-cut construction. An outstanding performer. 60c

*TM Reg.

ers, spar joiners. 1 6"x6"—1/16" plywood, spar joiners, cockpit deck, hatch. Scrap ¼" plywood, firewall.

3/64" dia. wire, wing hooks, torque rod. 1/16" dia. wire, wing mount, tail wheel strut. ⅛" dia. wire, landing gear. 3" dia. wheels. ⅞" dia. tailwheel. R/C gear as required: 1" Lord Mount, silk or Nylon, clear, colored fuel proof dope, cement, lightweight tissue, Weldwood.

Hawker Hurricane

(Continued from page 29)

mount if the wood type is to be used. Now, cut all bulkheads to shape from hard sheet balsa. Join the fuselage sides at the rear and insert bulkhead "E". Apply plenty of cement and set aside to dry thoroughly.

Complete building details are available on the full-size plans.

Bill of Materials

2 ¼"x3"x36" med. balsa, empennage, spar, fuselage sides. 1 ⅛"x4"x10" plywood, spar, bulkhd., tail wheel support, landing gear support. 8 3/32"x¼"x36" med. balsa, fuselage planking. 4 3/32"x3"x36" med. balsa, wing covering. 1 ⅛"x3"x36" hard balsa, wing ribs, fuselage formers. 1 3/32" dia. 24" lg. music wire, landing gear struts. 1 1/16" dia. 24" lg. music wire, control rod, tail wheel strut. 1 ½"x3"x4" hardwood, engine mounts. 1 .020" dia. 36" lg. music wire, lead-out lines.

Miscellaneous: 1 oz. white dope, cement, 2 oz. fuel proofer, 4 oz. med. grey dope, 2 oz. brown dope, 2 oz. olive drab dope, pins, bellcrank, fuel tank, control horn, Plastic Balsa, 4 oz. Testor Sanding Sealer, red, white, blue, and yellow Trim-Film, aluminum spinner, nuts, bolts, 1¾" wheels, tin can, Scientific pilot, rubbing compound, .005" sheet plastic. "Alfa-bets."

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Plastic Laminated

(Continued from page 33)

mold. Stearic acid is the best suited for the job as the mold will attain a neater finish.

Secure the patterns to a smooth board similar to the one shown in Figs. A and B. Apply the stearic acid with a brush, Fig B. Mix the plaster to about the consistency of thick cream, then paint on a thin coat starting at the parting line and working up, then covering the complete pattern. This layer should set a few minutes before the second coat is applied. Then allowing this coat to set, repeat as before until the mold has a typical wall thickness of not less than one half inch. If you plan on using the mold more than once or the mold is of considerable size, we would suggest that the last coat of plaster should have excelsior or any type of binder added to it for strength. Fig. C shows a mold with this application.

Methods: This data is based on tests and available information. However, no guarantee of complete initial success is possible due to the many variations in techniques that are presently employed in the fabrication of laminates. By following the proper instructions given by the manufacturer of the resins that you use, there should be very little trouble in mixing for its preparation before laminating. In the case of using room curing resins, always remember that the ACH catalyst should be thoroughly mixed into the resins before the cobalt naphthanate is added to the resins. The reason is the ACH and cobalt are reactive when mixed together.

There is quite a debate for the best method to use in the laminating of resins and glass fabrics. Theoretically the correct system calls for impregnating the glass fabric, then the layup into the female mold, Fig. E, or over a male mold. After the laminates have cured, the shell is removed; always check to be sure that the laminates are intact and in the correct contour. Some method of parting the laminate from the mold without removal of the plaster along

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with the laminated piece, is required. A simple but lengthy method is to cure the plaster mold in an oven (not over 200 deg. or the plaster will crack,) until all the moisture has been removed. A can of paraffin is melted and while the mold is still warm, the wax is impregnated into the plaster by brushing, building up the wax into the mold to its contour. To remove the laminated part after it has been cured, simply reheat the mold slightly, then remove.

Another method for releasing the part from the plaster mold is by applying one coat of shellac and two coats of carnauba wax. Any top quality auto wax will do nicely. Using an acid brush, the resins were applied to the glass fabric which we tailored and formed into the mold. The shells were found to part from the mold with very little trouble but in some tests during removal of the part, plaster came with the shell. After about five layups with this method, we then considered spraying the first coat of resins into the mold. After the cast had cured a laminate was pressed and shaped into the mold. The resins were then applied by a brush. After the laminates were fully cured, the part was removed with success. We are inclined to think, if this method is to be used, that spraying the mold with resins as the first step is the answer, as it will prevent the styrene in the resin from dissolving the wax on the mold.

The present method that we are using is as follows. After the mold has been lifted from the pattern, we simply apply one or two coats of wax, next a coat of Hi Glow 785 parting agent is sprayed into the mold, followed by another coat. The mold is now ready for the laminating of glass fabrics.

Allow the laminates to cure completely for at least one or two days before removing from the mold. This eliminates warpage. The 785 plastic parting agent may be obtained from Western State Lacquer Corp., Los Angeles, Calif., or they will refer your request to a more convenient location. There is also a similar product called Garalease 915 which is designed for use with

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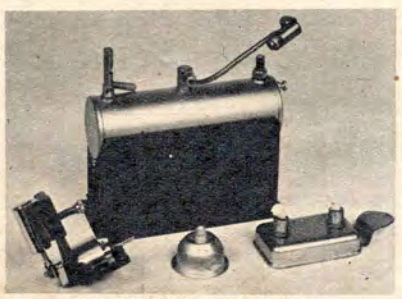

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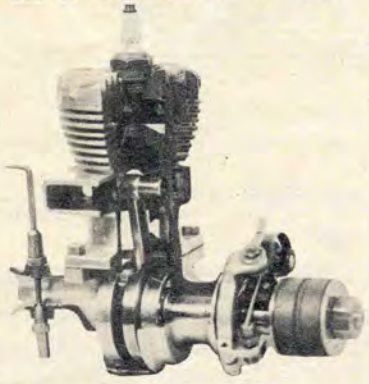

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polyester laminating resins. This agent may be applied by spray or brush, procurable from Garan Chemicals, 7213 Santa Monica Blvd., Los Angeles 46, Calif.

Laminating: Using the mold as a pattern, tailor the glass fabric to shape before impregnating with resins. We simply lay in a piece of cloth to its approximate shape, then trace with a soft lead pencil its contour at the parting line. Then cut to outline allowing approximately ¼ to ½" flange of cloth extending outside the mold. After the master pattern has been cut to shape, finish by cutting the remaining layers needed. Always bear in mind that the glass fabric is what will give strength to the part, plus weight, the resins are merely the bonding agent. We used Marco 28 C resins in all of our laminates. Information regarding the resins may be obtained from Marco Chemicals Inc., 1711 Elizabeth, W. Linden, N. J.

The glass fabric may be impregnated outside of the mold first, then worked into contour inside the mold, or it may be laid in the mold in a dry form, then impregnated by applying the resins with a brush, up to and past the parting line. After each layer has cured (this is determined by touch to check) follow by applying the next. This process is suggested for each ply used. After the first layer has cured, trim the laminate as illustrated in Fig. F; this will establish a trim line for finishing the part. The last layer or layers may be trimmed after the shell has cured. To release the laminate from the mold simply flex the shell away from the sides. Fig I illustrates its flexial characteristics. The photo is an example and does not imply that all laminates will do this, but is mainly to show how it will aid in removal. As you pull or flex the shell away from the mold you will notice that it will start to part. If the laminate will not release, break the plaster gently rather than destroy the shell.

Trimming and Finishing: Laminated components may be trimmed with a razor blade or knife allowing about 1/16 inch to be completed by filing or sanding down to the parting line. Replace it into the mold and use it as a guide (Fig. G) to finish. Matching of the parts before internal structure is added is shown in Fig. H. After the internal structure has been added a few coats of sanding sealer may be required to finish before color doping.

As for joining the parts this is up to the designer as to the methods. Some we have suggested, but this will depend upon the size, design. The mixed resins alone were found to be one of the best adhesives to secure one part to another, such as fuselage sections, cowling for speed jobs, (Fig. J), pants, etc.

Glass fabric laminates, it is obvious, may be used in our hobby to great advantage. Components are fuel-proof and flame-proof, yet are not fireproof, but will tend to preserve our labor spent in the making of a model. The resins alone after being mixed may be used as a sealer for landing gears and firewall installations, by painting on as shown in Fig. K. The glass fabric may also be applied to any balsa parts such as fuselages, leading edges, etc. in place of silk or paper to give the wood added strength. On some of the components that you may make, you will find that the glass fabrics will not tend to pick up the mold contours; in this event, simply cut the fabric and overlap the ply into the mold. After it has cured, the overlap may be sanded down to facilitate the next ply.

Southern Scene

(*Continued from page 37*)

Valdosta is advocating "Father and Son" events. This would straighten out some doubtful questions about fathers building ships for their little boys to win with. Next year, why not hold a meet on Father's Day restricted to fathers and sons, and make this a special event in big meets?

Bill King at Rome, Ga., reports that Uncle Sam has gotten his top flyers. Robert Caldwell and Wesley Earwood are in service; Bob Cordle is now in the Air Force, and James Gould an instructor in Link trainer at Spencer Air Force Base, Moultrie, Ga.

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Interesting letter from Chet Farage of Pensacola, Fla. He's been a modeler for 20 years. Has one son in the Navy, one in Naval Reserve, and a daughter of 17. Chet says in his resort town the modeler's greatest competition is "beautiful beaches and lovely water ski queens!" We're still hoping for another fine unrestricted meet at Corry Field, like the one in 1950. If Orlando drops the Tangerines, why don't you folks stage it?—*R.H. Elliott, Box 5078, Atlanta, Ga.*

English A.2 Viking

(*Continued from page* 40)

if possible.

The best flight trim is just off the stall in a left-hand turn. To obtain this, make the model stall by removing weight and then put back just enough to barely flatten out the stall. Alternatively, you can leave the weight alone (*and* consequently, the tow hook positions), if you vary the wing incidence to obtain this trim. Straightness of tow is determined by finding the correct position of the tow hook in relation to the C.G. Once the tow hook position has been ascertained, this will be the same for both windy and calm conditions. Be prepared to run towards the model if the wind is very strong, since the steep climbing angle throws quite a strain on the wings. Even if the trim is stall-free in calm weather, a slight stall may develop in windy conditions, so watch out for this and correct with incidence packing.

Bill of Materials

Hard Balsa: 1 pc. 3/16" x 3" x 36" (wing T.E.). 4 pcs. ⅛" x ⅜" x 36" (wing L.E. and spar). 2 pcs. ⅛" x 3/16" x 36" (wing spar). 1 pc. ⅛" x ½" x 8" (tow hook mount). 1 pc. ¼" x 3" x 6" (nose block).

Medium Balsa: 1 pc. ⅛" x 3" x 36" (bulkheads, ribs and fin). 6 pcs. 1/16" x 3" x 36" (fuselage sheeting, ribs and fin). 7 pcs. 3/16" x 3/16" x 36" (longerons and stab L.E.). 4 pcs. 1/32" x 3" x 36" (wing and stab sheeting and tips).

Remainders: 1 pc. 1/16" x 6" x 12" plywood (wing ribs). 1 pc. 1/32" x 6" x 12" plywood (wing ribs and dihedral braces). 1 pc. ¼" dia. x 24" dowel (wing fixing). 1 pc. 3/16" dia. x 24" dowel (wing and stab fixing). 1 pc. ⅛" dia. x 1½" dowel (auto-rudder). 4 sheets lightweight tissue, 1¾" of curtain rail and end stop, ½ pint clear dope, cement, thread, nose weight.

CONTEST CALENDAR

List meets here! Advise Air Trails 90 days in advance to do the most good for your meet. If any area restrictions on entries, be sure to state. Address of contact man in same city as site of meet unless otherwise specified. Where info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered—OR; outdoor hand launched gliders OHLG; indoor glider—IG; towline gliders—TL; free flight gas—FF; control line speed SP; control line scale—CLSC; control line stunt ST; team racing—TR; combat COM; radio control—RC; rise-off water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; controline endurance—CLEND; Wakefield—WAK; PAA-Load—PAA.

Aug. 16—Rainier Prairie, Wash. Olympia MAC meet. FF; OHLG; RC. Keith Dubendorf, Box 501, Olympia.

Aug. 16—Akron, Ohio. SMPE's meet sponsored by Women's Chapt. NAA, Frances Alexander, 25 Mull Ave.

Aug. 16—Grimes, Iowa. Des Moines Modelaires meet. C. R. Gould, 3840 38th St., Des Moines.

Aug. 16—Waukesha, Wis. Wingmen & Coludbusters meet. W. J. Deffner, 839 Gaspar St.

Aug. 16—Hicksville, L. I., N. Y. Screamin' Demons' 7th annual meet. Bob Buragas, 255 Laurel Ave., Arlington, N. J.

Aug 16—Long Beach, Cal. Thunderbugs annual FF meet. F. L. Swaney, 527 East 55th St.

Aug. 19-24—Detroit, Mich. International Plymouth Modelplane Contest. See your local Plymouth dealer.

Aug. 23—Tampa, Fla. American Legion & Flying Buccaneers meet. George Fowler, Box 398, Rt. 4.

Aug. 23—Bridgeport, Conn. Aeronuts meet. FF; RC; Limited rubber. Phil D'Ostilio, 47 Cardinal St.

Aug. 23—Sepulveda FCB, Cal. Inglewood Half-A FF scale. L. W. Puncher, 2317 Bordon Ave., Torrance.

Aug. 23—Lancaster, Pa. Exchange-Plymouth-LMC meet. Al Geltz, Landisville.

Aug. 30—Norfolk, Va. Middle Atlantic Championships. A. K. Anderson, 436 Penn. Ave.

Aug. 30—Floyd Bennett Field, NYC. Mirror Model Flying Fair. Ted Clodius, N. Y. Mirror, 235 E. 45th St., New York City.

Aug. 30—Gettysburg, Pa. GMAC meet. J. H. Pitzer, 9 Hanover.

Sept. 6—Medford, Ore. Prop Nuts 7th annual. FF; ORU; TL; RC. T. W. Mast, 828 W. 2nd St.

Sept. 6—Miami, Fla. Miami Modeleers Cl. AA 1st Annual Hurricane Meet. Wm. J. Lumley, 9028 N.W. 22nd Ave.

Sept. 6—Monticello, Minn. Cl. AAA 5th Upper Midwest PAA-Load Contest. Ralph Costlow, 1709 Lagoon Ave., Minneapolis, Minn.

Sept. 6 & 7—Pawtucket, R. I. 7th New England meet. FF; RC; COM; SCALE. A. C. Bergeron, 55 Ricard St., Seekonk, Mass.

Sept. 7—Far Hills, N. J.—Lions Club annual CL meet. S. D. Barradale, Prospect St.

(See also contact mention in Dope Can, R/C, Southern Scene, and Western Roundup columns.)

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Cameron 2-Speed

(*Continued from page 48*)

contains the base and the cylinder housing in one casting. This is fitted with a large oilless bronze bearing for the crankshaft. The shaft is hardened and ground steel with a large diameter bearing and rotary valve. The front end of the shaft is tapered where it leaves the crankcase bushing to receive the tapered driving washer. This arrangement gives best driving action and is not affected by wear. A hard steel washer is placed between the drive washer and crankcase to act as a thrust bearing when the Cameron is used as an electric starter. The two-speed needle valve arrangement is made very compact by having the upper needle valve handle slightly shorter than the lower; they will interlock with each other as can be seen in the photograph.

The fuel recommended in the instructions of 4 parts alcohol and 1 part castor oil was tried with good results in the two-speed operation. Adding nitromethane to this fuel in place of part of the alcohol produced an increase of 1500 rpm. The extra power would not be required in most radio-control ships but would be of great help in control-line flying.

Parts Illustrated

1. Crankcase: die-cast aluminum, 1.48 oz. 2. Cylinder head: die-cast aluminum, 1⅛" dia., .25 oz. 3. Piston: steel, hardened & ground, .623" dia. x .640" long, .32 oz. 4. Cylinder: steel, .623" bore x 1⅛" long, .53 oz. 5. Wristpin: steel-hardened & ground, .170" dia., .04 oz. 6. Wrist pin pads: brass, .01 oz. 7. Connecting rod: aluminum, 31/32" long, .02 oz. 8. Glow plug washer: aluminum, .032" thick. 9. Glow plug: steel, ¼-32 thread, .08 oz. 10. Low speed needle valve: aluminum, brass & steel, .09 oz. 11. High speed needle valve, .10 oz. 12. Steel thrust washer: steel, .015" thick, .03 oz. 13. Crank shaft: steel-hardened and ground, .370" dia. shaft, .172" dia. crank pin, .75 oz. Drive collar: aluminum, ¾" dia., .21 oz. Front washer: steel, ¾" dia., 12 oz. Propeller nut: steel, ¼-28 NF thread, .11 oz. 14. Crankcase & cylinder head bolts: 3-48 NC thread, .11 oz. 15. Back cover plate: die-cast aluminum, 27 oz.

Engine Data

Performance. Weight: 4.52 oz. Propellers: 9/4, 12,800 rpm; 8/6, 13,500 rpm; 8/3½, 14,000 rpm; 7/4, 17,000 rpm; 9/4, 11,000 rpm on cold fuel. Fuel: 2 parts alcohol, 2 nitromethane, 1 oil. Fuel level test: 15" at 11,000 rpm.

Design Data: Displacement: .193 cu. in. Class: A. Stroke: .630 in. Bore: .625 in. Stroke bore ratio: 1.02. Compression ratio head: 5.5. Compression ratio base: 1.58. Port area intake: .049 sq. in. Bypass: .047 sq in. Exhaust: .071 sq. in.

Construction Features. Double needle valve for two speed operation.

Little Augie

(*Continued from page 39*)

it in place. The balsa streamline fairing will help to hold the rudder and stabilizer in alignment. After the tail section is finished sand the edges round.

Cover the fuselage in sections to get a good job. Water the covering and when dry dope the entire model with a dope that has been "cut" 50% with thinner. If you choose to color-dope the model go easy with the brush since any weight that you will add will detract from the flying.

Glide the model over a grassy area. If it stalls add weight to the nose. The glide should be straight and ten to fifteen feet ahead of you. After the model glides well (and all the gliding should be done with an empty jet) the jet can be loaded. When lighting the jet DO NOT LOOK IN THE TAIL PIPE! When you can hear that the jet is burning launch the model by running and letting it lift out of your hand. This way the model will not settle back to the ground due to insufficient initial thrust. To have the model circle, bend up one elevator at a time to produce a flat turn.

R/C Combo Meter

(Continued from page 57)

R2. The resistors R1 and R2 in the FSM shown are the ordinary ½ W. carbon variety, but they were carefully picked for correct value. If you don't have access to a quantity of these resistors, you can purchase what are known as "carbon film" resistors, which come in 1% tolerance, and are inexpensive. Ohmite Carbofilm type CP-½ will do nicely.

The milliampere shunt resistors R3 and R4 must be home made, since you can't purchase resistors close enough for this purpose. The approximate values are given on the diagram, but the only way to get them accurate is to connect the unit up to a meter of known accuracy, and calibrate by clipping the resistance wire to exact length. The sketch shows how this is done. Always disconnect the battery before adjusting the resistor. When the proper length of resistance wire has been found, it may be soldered to a couple of lugs or clamped in small binding posts. If a different make of meter from that specified in the parts list is used, these resistors may have to be of considerably different value. Resistance wire for them can be taken from old radio wire wound rheostats.

For field strength use (which simply means measuring the power your transmitter puts out into the air) a small antenna is required. Two feet of 3/64" music wire was used here, soldered into a banana plug from the BC-366. The longer the antenna, the higher the meter will read. However, there isn't much use in making it more than four feet long, and even two will give good readings from a properly adjusted transmitter, at a distance of 10 feet. As an example, the meter went to midscale, when placed on the ground about 12 ft. from the Mac-II transmitter; the same distance from a 3A4 triode job gave about a quarter scale reading. It is, however, much more reliable to use an antenna long enough to get a good reading ten feet or so away, rather than a very short one, with the FSM placed right next to the transmitter.

The meter will read higher if it is setting upon some metallic surface, such as a car hood. If you make it a practice to put it on the car, you can check the transmitter each time you set it up, noting if the FSM meter reads about the same. If it doesn't (and the meter is the same distance away), the transmitter might not be loaded up correctly, the batteries a bit low, etc.

To get a fairly close check on the transmitter frequency, always use the same length of antenna in the FSM, and put it in the same location; it is probably best to hold it in your hand for this test, since you will want to turn the tuning knob anyhow. Different locations (on a car hood, for example) and different antenna lengths will change the tuning a bit.

When you first put the FSM into operation, it will be necessary to adjust the coil core to the right spot. Set the condenser knob to mid-scale, and move the core till your transmitter signal shows maximum reading. With the components given, the tuning range is actually about 2 mc.; you could calibrate the condenser to cover the ham 10 and 11 meter bands, as well as the 27.255 mc. spot, if you want.

Just a note on testing dry cells; it proves very little to check them with a meter as sensitive as this one, unless they are loaded. The best way is to test them with the transmitter or receiver turned on; you then can see what the voltage is, under the actual operating conditions. Sometimes this is not convenient, though. It is quite practical to install "built-in loads" for the voltage ranges. The connections are shown dotted in the diagram.

The load resistors, R5 and R6, must be compromise values, since many different types of cells and batteries will be checked. The values shown for these resistors will give a full-scale drain of about 500 ma. on the 5V. range, and 50 ma. on the high range; thus, you would have a drain of around 150 ma. on a 1½ V. cell, and 45 ma. on a 45 V. battery. This will serve quite well for all the normally used sizes of batteries. A switch could be installed to cut out the

15 Fifteen Famous Fighters 15

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"load resistors," if desired. Ordinary 2 W. carbon resistors will do the job.

When using this instrument to check the plate current of a receiver mounted in a plane, the meter should be off the ground (put it on the plane itself, if possible) and the shortest possible leads employed. Long leads, and capacity of the meter case to ground, might upset the tuning and loading of the receiver; you could thus get an entirely different action when the meter and its leads were removed from the plane. Connection arrangements are up to the individual. One neat way to solve the above problem is to put a plug on the meter case, and hang the whole meter on the plane test jack. This won't do for Half-A jobs, of course! For battery testing, an ordinary plug with a couple of leads ending in test clips are handy.

You will doubtless find more uses for this handy gadget as you use it. Since the switch that comes in the BC366 has only five positions, we are limited to that number of meter ranges. It is possible to shift the unused contacts around (or you *could* buy another switch) to get other combinations, if you feel they are needed.

Parts List

Case—surplus BC-366, Electronic Specialty Supply Co. M-500 microampere 2" square meter, Electronic Specialty Supply Co. L—slug tuned coil, Electronic Specialty Supply Co. C1—15 mmf. midget variable condenser, Bud LC-2706 or equiv. C2—30 mmf. mica or ceramic. C3—500 mmf. mica or ceramic. SW1—5 position, two circuit rotary switch, comes in BC-366. J—single circuit jack, comes in BC-366. R1—Precision carbon resistor, 10,000 ohms. R2—precision carbon resistor, 100,000 ohms. R3, R4—must be home made. R5—1000 ohm 2 W. carbon. R6—10 ohm 2 W. carbon. SW2—single pole, single throw slide type. RECT.—Raytheon CK705 germanium rectifier. Two knobs, material for desired test leads.

FW 190

(*Continued from page 27*)

will govern the plywood bulkhead shape and type of engine mounting. It will be noted that the nose ring is made of two pieces "A" and "B", cemented together. The fact that these pieces are of different diameters causes an annular notch to be formed to fit the planking strips when they are applied later.

Complete building instructions are available on the full-size plans.

(*Continued on next page*)

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Miscellaneous: 4 oz. grey dope, 4 oz. Sanding Sealer, 4 oz. green dope, 2 oz. fuel proofer, cement, pins, sandpaper, Scientific pilot, control horn, bellcrank, fuel tank, 1-½" wheels, small screw eyes, red, white and black Trim-Film, .005" sheet plastic, Plastic Balsa, aluminum spinner, screws, scrap hardwood, tin can, dowel, masking tape, thread.

Dope Can

(*Continued from page* 10)

friendship among modelers. Says Dick, "United Nations take note!"

Period of Silence. One of the by-laws written into the constitution of the Aero-Rebels down Winchester, Va., way stipulates that any model meeting an untimely demise on the field shall be honored by 30 seconds of silence at the immediate scene by every member, uncovered and at attention. Or so Bill R. Clarke tells us. Bill sent along snaps of two of his beauties which had escaped such fate—so far: a Pitts Special with Torp .19 and an AJ-1 Savage with two OK .074's and a Jetex 150.

Convair Record Setter. New Open-class B speed record holder is William T. Timmons, a design engineer with Convair in Ft. Worth, Texas. Bill bettered the old 136.99 1950 mark by a good margin when his job turned in 142.46 at a Cowtown Sahib Club meet. Timmons was a wartime B-25 pilot and later studied aeronautical engineering at the University of Texas. Although it was after the war before he branched out into model aircraft to include powered models, he already has accumulated 56 trophies.

"One of the most important items in speed flying is to reduce engine friction as much as possible by polishing and lubricating the parts," Timmons explained. "Between contests I experiment with different types of fuels and props."

Diesel Fuels. Bernard R. Marsh who edits the very informative *Hobby Highlights* newssheet from Toronto reports on home-brew diesel fuels concocted by his Canadian pals: 1 part castor oil, 1 part kerosene and 1½ parts ether with no Amyl Nitrate (apparently Bernie uses some of the latter). Cece Tate of the TeePee Hobby Shop uses 1 part diesel truck fuel (No. 1 or No. 2), 1 part

(*Continued on page* 78)

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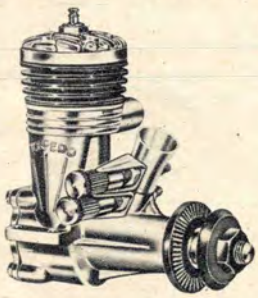
TWO-SPEED TORPEDO .19



K & B establishes another first with the first two-speed glow ignition engine. This engine is equipped with two needle valves and is very practical for use where engine control is desired. Radio Control and other special events as the many carrier event is primarily the reason for the manufacture of this engine. Any reliable motor control unit may be used, however for radio control, K & B recommends the Bonner escapement shown on this page. The Torpedo .19 two-speed is available at your dealers **$16.95**

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TEX'S TACKER

This new Ideal sail boat is a prefabbed affair designed by Tex Foster, famous model yacht authority. Hull is 18 inches long, permitting it to carry a goodly amount of sail. It's been christened "Sea Weed" by Ideal Models. The kit retails for $3.95. Still not too late to get in some model sailboating this summer!

ROLLING STOCK

These are the new K&B streamlined wheels which come in four sizes: 1" diameter, 15¢ each; 1½", 20¢; 2", 25¢; and 2½", 30¢. Wheel hubs are aluminum. Axle holes are drilled to 1/16" diameter in the 1" wheels; 3/32" in the 1½ and 2" wheels; and ⅛" in the 2½" wheels. Tires are a sponge rubber material resisting fuel damage.

MIGHTY MO

A 20-inch replica of the United States battleship Missouri is the latest from Revell, producers of the Highway Pioneer antique auto kits. All-cast plastic kit sells for $1.98. Comes in grey; special details include guns, twin seaplanes and catapult launching gear. Beam is 2 inches; from waterline to radar screen, 8 in.

DID YOU SAY 10¢?

This new ready-to-fly Jetfire glider from Guillow features a colored plastic silhouette canopy arching over the pilot's head. Balsa model is printed in red and blue. Wing is 12 inches in span, features camber and dihedral. Sells for 10c; balsa sheet body is smoothed and streamlined. Authentic markings imprinted.

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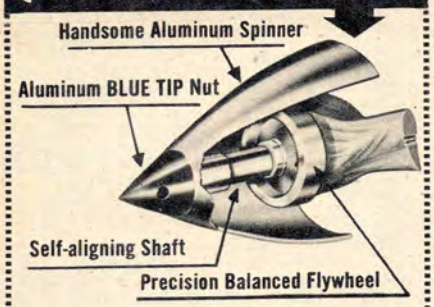

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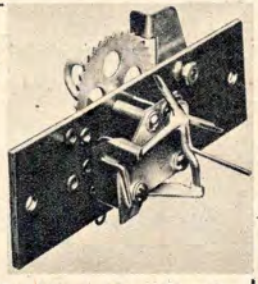
R/C CONTROL BOX

Cooper Controls Co. says this control box permits proportional control of rudder or elevator plus throttle control. Priced at $14.95. Features: quick response in any degree without concern for sequence; converts any xmtr to multi-channel type of operation without carrier modulation; positive safety radio failure feature.

CAVACRAFT'S CAT

The "Little Sailor" is a prefabbed miniature cat-boat for desk or real sailing. This is kit E-3, a 75¢ job, by Cavacraft. A colorful overall deck decal gives a very finished appearance. Hull is partially assembled. Mast and boom slip into place, you hoist the sail and you're ready for launching. Die-cut parts and instructions.

TOPS IN RADIO CONTROL



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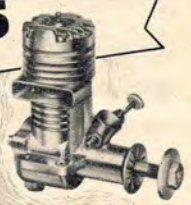

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(*Continued from page 75*)

SAE 50, 60 or 70 oil, and 1 part ether. The usual amount of Amyl Nitrate (2%) may be added if desired. Says BRM: "This is certainly the cheapest mixture to make up that I have come across yet. Saw it used at the field and it performed very well. Regarding the addition of Amyl Nitrate to a fuel—my own personal opinion is that it makes for easier starting."

Non-AMA Half-A Flying Scale. Out on the West Coast Dick Everett and friends complain because too much emphasis is given to flying credits in the new AMA Half-A free flight scale regulations. In the East, the feeling is just the opposite—at least that's what Bob Buragas sez the Screamin' Demons of Long Island contend.

The Demons will run off their flying scale event on October 4th as a highlight of the two-part 7th annual Long Island Model Airplane Championships. *Flight* has been considered to be an important part of this type of model and so provision has been made to make this a *free flight* event. Bob points out that certain practical considerations must be realized ("No, no!" shouts Everett). To do this it has been necessary to deviate from the Academy's rules and eliminate the "bite" (his words) of perfectionism. Bob says the SD's aim is more modelers flying modelplanes.

Basically the rules call for any engine not greater than .05. No weight specifications. Any plans can be used. They're not required unless the model "is of a highly questionable nature." Three judges rate entries; their points are averaged. A maximum of 100 points provided for fidelity to scale, workmanship, finish and detail—no more than 25 points per division. No points will be awarded for internal details or finish. A minimum of 30 points will be granted all entries. The best model gets 100 points. No handicaps will be handed out on models not featuring fully enclosed engines or tanks provided an honest effort has been made to retain scale appearance.

Each entry gets six attempts. Launching is by hand; motor run is 30 seconds. Highest 3 flights are added for total. Best flying model receives 100 points; all others receive points in ratio to the winning time.

Simple, hey? Quite a departure from the National Contest scale event with judges sitting all night in judgment. You know what—we bet the Screamin' Demons get more flying scale entries at the Long Island meet than the Nats do at Philadelphia!

Flight Plan Contest. Almost all of them laughed when Jim Walker appeared in public with his first control U-Control model. But, brother, look at control line flying now—it's gone clean around the world. (Well, now, with those glow plug engines, maybe it shouldn't be called exactly "clean.") So when Jim suggested this Flight Plan Contest of his, you'd think we'd all have enough sense to stop and listen to him. But not the U.S. model leader—no sir, he seems to be the guy who's first to mumble, "It won't work, nossir, never."

We received some more ammunition from Jim regarding FPC. Rules and suggestions are pretty much boiled down. Thought you

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WONDERWINGS radio control semi-scale biplane by S. Calhoun Smith. Span is 44 inches, length 34 inches, total wing area 480 square inches, weighs 46 ounces with conventional receiver and escapement. For engines of .14 cu. in. displacement or equivalent.

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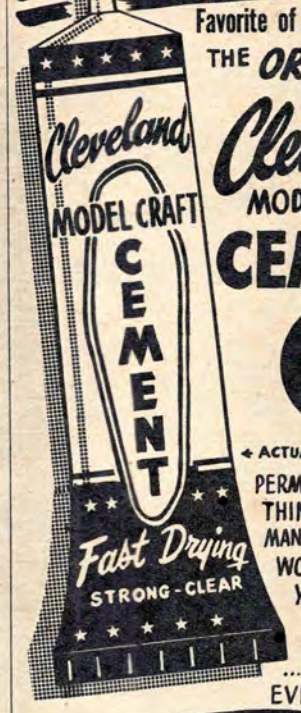

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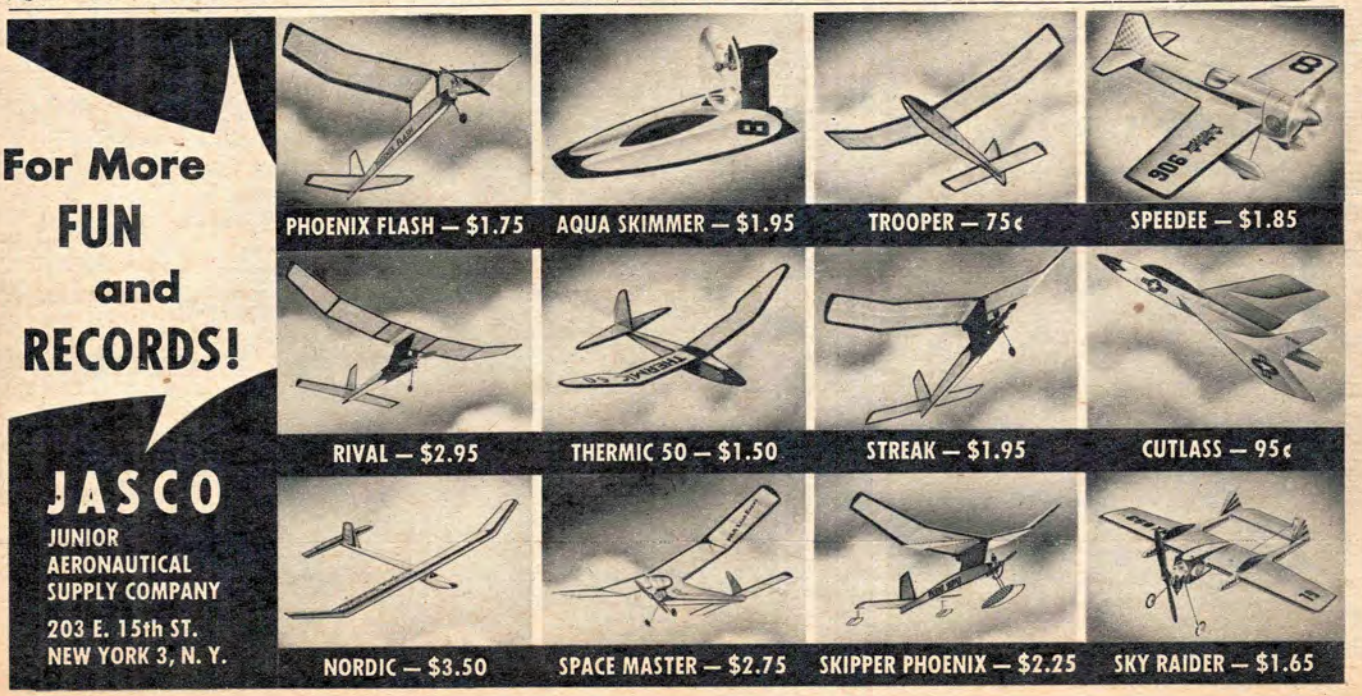
might like to have them handy for the next club meeting. They should lead to some interesting discussions . . .

Regulations are simple. The contestant files a flight plan with the judge before taking off, stating what the flight is to consist of. (Actually, all this requires is the flyer filling in three boxes on a printed sheet.) Points are compiled according to how close he or she follows the flight plan. Three official flights are allowed, the highest score of the three is used to determine winners. There are no engine classifications so this means an old CO_2 can compete against a Class C job.

In box #1 the flyer has written the number of circles he expects his model will make before it lands. In the second box he jots down his estimated duration in seconds. The third box he doesn't worry about since it is just a reminder that if his model comes down on a pre-arranged spot—a spot which he has marked with a colored balloon—he gets 100 points.

Okay—he makes his flight. The judges count the number of circles. The contestant receives 10 points for every circle he makes up to the stated number; he has 5 points deducted for every circle above or below that number. Let's say you listed 18 circles and you make 13. You receive 13 x 10 or 130 points for the circles you completed, and 5 x 5 or 25 points are deducted. So you get 105 points for completing 13 out of the specified 18 circles.

While making your 13 circles your model stayed in the air 30 seconds. But you had figured you'd be up for 45 seconds. So the judges credit you with 2 points for every second your model flew up to the stated duration and deduct 1 point for every second over or under the stated duration. Thus you get 30 x 2 or 60 points for the duration, and are penalized 15 x 1 for the "under" miss. Total points for duration, 45.



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For the third phase of every flight, the judges check on your ability to bring your model down close to your spot landing marker balloon. They deduct 1 point for every five feet you're over or under the mark. If you miss by 500 feet—no score. Say your ship landed 45 feet from the marker. They divide 45 by 5 and knock off 9 points from the 100 possible. So you get a total of 91 there.

Adding your circles score, the duration points and the spot landing allowance, you end up with a total of 241 points. Now on your next flight, considering the performance your model has just turned in, you say you'll shoot for 13 circles, 30 seconds and a spot landing. Wha' hoppens? Your model does 17 circles in 43 minutes and lands 300 feet from the marker. Your total score is then 197 points. Check us out and you'll see how easily that figure was obtained.

So-o-o-o, for your final flight you fill in the Flight Plan boxes with 17 circles, 43 seconds and a spot landing. You do 15 circles, 35 seconds and land 120 feet from the marker. Your 3rd flight total is 278 points.

For Sample Flight Card and set of rules your club can contact Jim at A-J Aircraft Co., 1166 N.E. 31st Ave., Portland Ore.

As an aid to those who want to run off a Flight Plan Contest, Jim passes along these suggestions: "Each contestant should be supplied with a marking flag of his own color which he is permitted to place wherever he chooses. He should make a number of test flights with a measured fuel supply or careful timer setting so he can determine his model's flight characteristics and landing spot. He should file his flight plan as quickly as possible after making his test flight in order to take advantage of similar wind conditions. Also, each contestant should be allowed to make three flights as nearly consecutive as possible for the same reason.

"After making the first official flight, the contestant should move his flag to the landing spot and immediately file a flight plan for his second flight which should be in duplicate of the actual circles and seconds flown in the first flight. Same, of course, holds true for his third flight plan which should be a duplicate of his second official flight.

"This type of contest should not be confused with a precision event since it actually is just the opposite. Precision contests are extremely difficult for even the expert flyer since it is an attempt to make the model do something that is not easily accomplished; whereas, in a flight plan contest the object is to duplicate the natural flight characteristics of the model."

Jim, our sincere thanks for all the good suggestions. And, gang, how about some reports on your attempts at Flight Plan competition? It sounds like a grand way to develop some swell club contests.

Get active in the GOC! The Ground Observer Corps needs volunteer plane spotters—everywhere! Be a plane spotter—work with the Air Force. For information on how you can help and man lookout towers contact your local office of Civilian Defense . . . or write Ground Observer Corps, U. S. Air Force, Washington 25, D. C.

Sure Pays to Advertise. Victoria, Texas, now can boast of the Prop Busters—a new club. The Prop Busters got their start when five model addicts decided to see what could be done about getting a group underway. The boys ran an ad in the local paper offering $25 for the best name suggested. "Thus," writes L. Yariger, Jr., president, "we got about 15 members right off the reel. Now having a name we needed a sponsor. Contacting one of our Plymouth dealers, he agreed. So we're in business! We meet every Thursday night at his showroom and he kicks the kitty each month with a nice check. We have had several interesting club contests which have gone over big with both the club members and our local townsfolk. Our first sanctioned meet was a 2-day affair in June. In about 18 months the Prop Busters have grown from 5 to the present membership of 57!"

Nice goin', gang . . .

—THE DOPESTER

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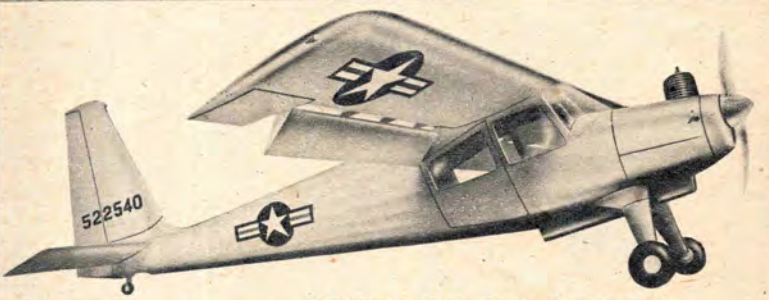

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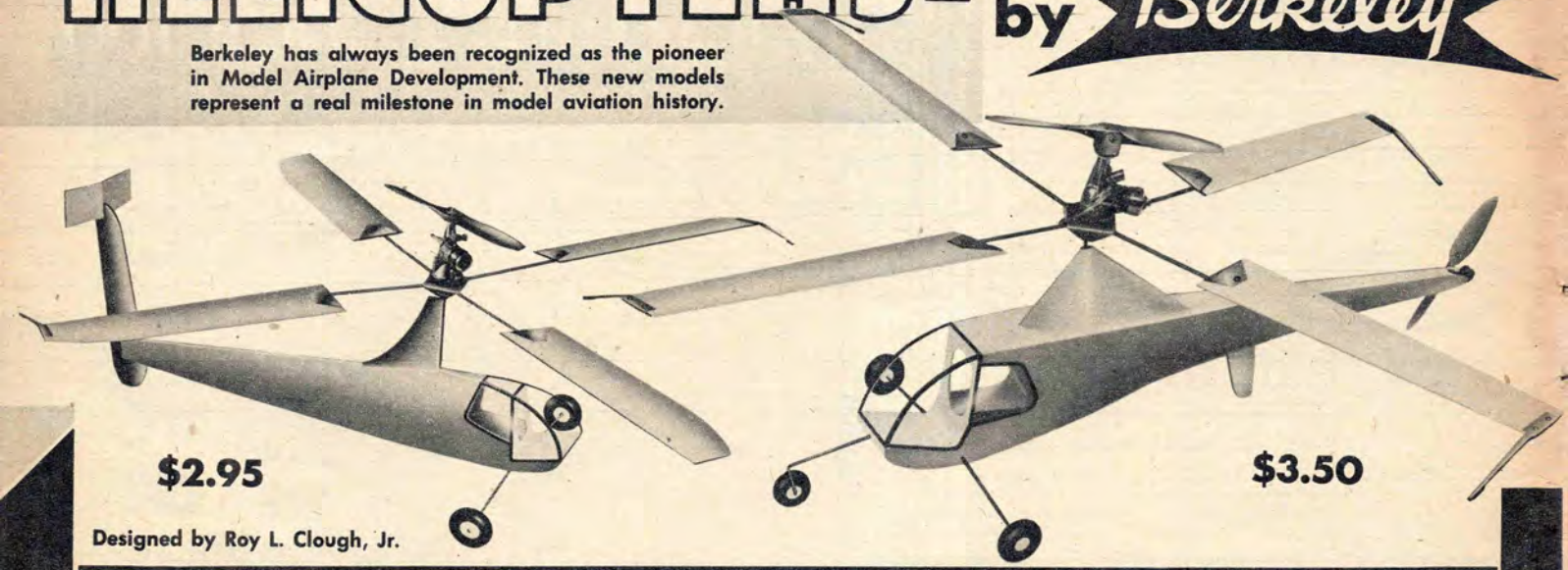

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CLOUD-COPTER "D"
with Fixed Drogue Tail

For .045 to .074 Engines — 26" Rotor Span

CLOUD-COPTER "TR"
with Adjustable Pitch Tail Rotor

For .045 to .074 Engines — 25" Rotor Span

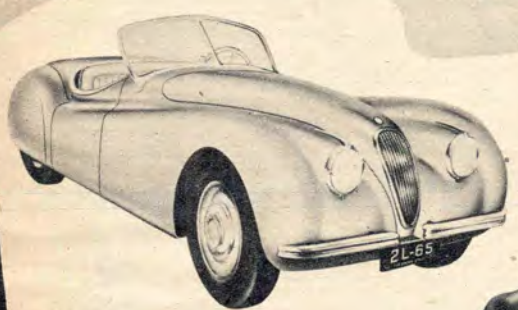
Here is a real advance in model flying. So new and different that the performance is almost unbelievable. You can actually adjust a "CLOUD-COPTER" to hover, fly forward or backward and even spiral climb like a conventional gas model. Fully automatic Cyclic and Collective Pitch Vanes, as on full-scale helicopters, permit the rotor to continue in the same direction after the engine stops. "CLOUD-COPTERS" are quickly built from our highly prefabricated kits.

EACH "CLOUD-COPTER" KIT CONTAINS:

Complete Metal Rotor Mast Assembly; Metal Blade Holders designed for quick replacement of blades; Metal Blade Balance; Engine Shock Mount; Shaped Rotor Blades; Die-Cut Sheet Balsa fuselage; Wheels; Die-cut Celluloid Windshield.

SPORT CARS - by Berkeley

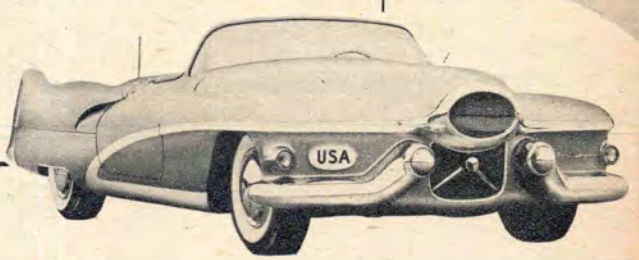
- JEWELRY CAST METAL BUMPERS, GRILL, LIGHTS, STEERING WHEELS!
- STAMPED METAL HUB CAPS!
- FULLY CARVED AND HOLLOWED BALSA BODIES!
- PLASTIC UPHOLSTERY!
- AUTHENTIC DECALS!
- FULL WIDTH METAL AXLES!
- RUBBER WHEELS!
- DETAILED FULL SIZE PLANS!



British **"JAGUAR"**

123.6 mph English Sport Car.

$1.50



General Motors **"LE-SABRE"**

330 Horsepower experimental car.

$1.50

Nash **"HEALEY"**

English Body, Nash Engine. 106 mph

$1.50

We have spent over a year perfecting special casting processes and gathering data on these sport cars. They are the ultimate in pre-fabrication yet competitively priced. Take a look and be convinced.

Note: The Jewelry Casting process enables us to give you superbly detailed clean castings.

Bodies fully carved ready for trimming and sanding.

buy BERKELEY at your local dealer!

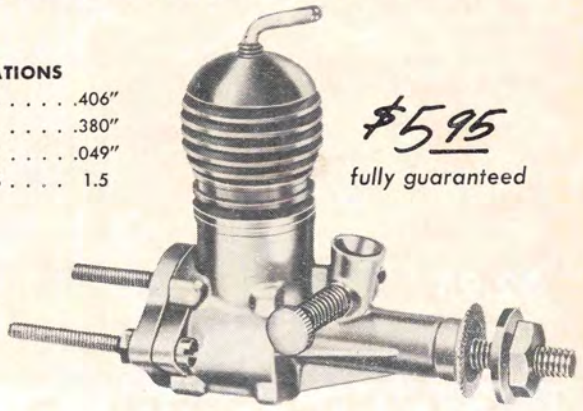
If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. AT., West Hempstead, N. Y. Please include 25¢ packing & postage.

POWER PLUS!

McCOY® .049 DIESEL

SPECIFICATIONS

BORE	.406"
STROKE	.380"
DISPLACEMENT	.049"
WT. IN OUNCES	1.5



$5.95
fully guaranteed

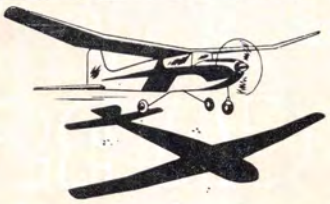
"It's the Contest Engine of the Year" *says KEITH STOREY*

THE SKY'S FULL OF McCOY'S

In every class of 1/2A flying, you get more of everything you need for championship performance with McCoy's great new Diesel engine. It's mighty powerful, says Keith Storey, veteran modeler, prominent control line and free flight designer and holder of many national speed records. *Here are some of Keith's findings and recommendations in 1/2A McCoy Diesel field trials:*

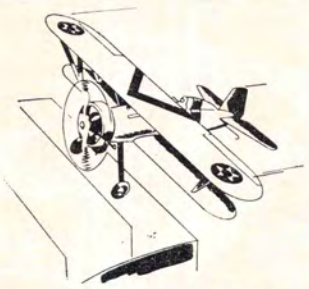
FREE FLIGHT (gas powered) USE: Prop, 6x4; RPM's 13,000. With a 20-second engine run a McCoy Diesel gives you greater thrust and more altitude. Starts easily and starts quickly.

FLYING SCALE USE: Prop, 7x3 or 7x4; RPM's 11-12,000. Fly larger, more sturdy airplanes. Weight of added detail to your craft is no handicap with a McCoy Diesel.



PAA-LOAD AND CLIPPER CARGO USE: Prop, 6x4 or 7x3; RPM's 13,000. Positive take off, fast acceleration and greater load capacity are characteristic of the McCoy Diesel.

CONTROL LINE SPEED USE: Prop, 4x7; RPM's 15,000. Exceptional fuel drawing qualities are notable in the McCoy Diesel. You get consistent feed for higher power output with the McCoy Diesel in this event.



NAVY CARRIER USE: Prop, 6x4; RPM's 13,000. The extra power you need for the larger 1/2A control line model is always there with a McCoy Diesel. Reliable RPM gives you steady, smooth flying.

So take a tip from one of America's leading flyers...get yourself a McCoy Diesel and become a winner.

The famous Checkered Flag Line. At hobby shops everywhere.

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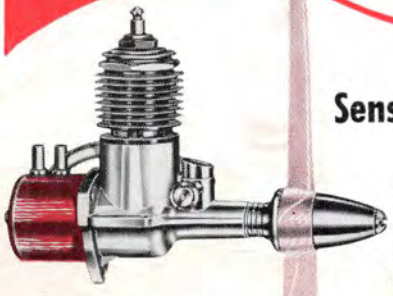
OK

...Bears Down on Price!
...Ups Power and Performance!



only $4.95
completely assembled with fuel tank, glow plug, propeller and spinner.

Sensational New ½A Performer
OK CUB .049B

For the beginner or the expert. A brand new, lighter, more powerful "OK" .049 CUB. Both radial and lug mountings — fast starting and higher speed — extended prop mounting for safer operation. Provides maximum output at higher RPM. See it now!

New Class A and International Class Displacement!
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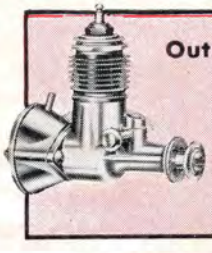
Complete Power Plants at Low, Low Prices!
OK CUB Combination Packages

Get an OK Cub Combination Package and enjoy the best in value, power and performance. Each package contains assembled engine, prop and fuel tank.

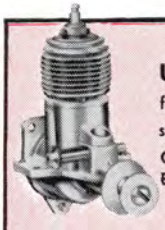
From $4.95 to $7.75

OK .049 Power Kit

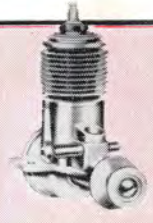
Enjoy the thrill of building your own engine with this precision assembly kit. Only **$4.95**



Outstanding ½-A
Rugged — easy to start — greater power.
OK .049X CUB Combination $6.25



Unmatched
for stunt and speed flying.
OK .074 CUB Engine only $5.95
Combination $6.75



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for powerful performance in Class A.
OK CUB .099
Engine only $6.95
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For Championship Performance!
OK GLOW FUEL

Ideal for breaking in glow plug engines. Methanol base heavily fortified with nitrates. Won't corrode, gum or varnish. Gives easier starting, smoother operation, higher speeds. For all OK's and engines of similar compression ratios. Full Pint **85c**

Quicker Starting, Faster Accelerating!
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Long-lasting platinum glow element assures easy starting, higher speeds. ¼-32 longs and shorts for all engines. **59c**

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